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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

January 1999

Data Assimilation
Meteorological Office
London Rd
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.| bias|	$\geq$ 4 hPa	(pressure),
	$\geq$ 5 $m\ s^{-1}$	(wind speed),
	$\geq$ 30 degrees	(direction).
2.SD	$\geq$ 6 hPa	(pressure),
	$\geq$ 80 degrees	(direction).
3.PGE	$\geq$ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BBXX	ALL	P	SUR	53	0	0	2.0	-5.1	5.5
CTHI	ALL	P	SUR	22	20	91	0.9	-11.9	12.0
ELTX5	ALL	P	SUR	20	0	0	0.8	6.6	6.6
ELVJ9	ALL	P	SUR	20	0	0	1.5	-4.1	4.3
PCCZ	ALL	P	SUR	53	0	0	1.3	4.7	4.9
PEXX	ALL	P	SUR	51	0	0	2.3	-4.4	5.0
PFSK	ALL	P	SUR	38	0	0	0.9	-4.1	4.1
P3NJ5	ALL	P	SUR	57	0	0	1.3	4.0	4.2
UDUE	ALL	P	SUR	28	15	54	1.0	13.8	13.8
UFJU	ALL	P	SUR	29	29	100	0.0	0.0	0.0
UGOK	ALL	P	SUR	26	0	0	1.2	-7.1	7.2
UIKI	ALL	P	SUR	57	0	0	1.4	4.2	4.4
VVGG	ALL	P	SUR	25	0	0	3.3	6.5	7.3
WDZB	ALL	P	SUR	27	0	0	1.1	-5.6	5.7
WQZ9670	ALL	P	SUR	42	0	0	1.9	-8.4	8.6
ZCAM9	ALL	P	SUR	42	0	0	6.7	4.4	8.0
3FGQ3	ALL	P	SUR	49	0	0	1.3	8.1	8.2
31497	ALL	P	SUR	70	70	100	0.0	0.0	0.0
9MCM	ALL	P	SUR	44	0	0	1.5	4.1	4.4
WIND SPEED									
C6JE5	ALL	SPEED	SUR	89	0	0	3.5	-7.5	8.2
C6LQ3	ALL	SPEED	SUR	47	6	13	8.9	7.9	11.8
C6NI3	ALL	SPEED	SUR	29	0	0	5.2	5.5	7.6
C6OX6	ALL	SPEED	SUR	25	0	0	5.4	10.3	11.6
DUQM	ALL	SPEED	SUR	110	1	1	4.1	5.8	7.1
ELNK8	ALL	SPEED	SUR	20	0	0	3.9	6.9	7.9
ELRR2	ALL	SPEED	SUR	25	0	0	3.3	5.7	6.6
ELWC6	ALL	SPEED	SUR	25	7	28	4.2	17.4	17.9
J8UC8	ALL	SPEED	SUR	28	0	0	5.7	6.9	8.9
LAEP4	ALL	SPEED	SUR	35	0	0	2.4	7.4	7.8
METEO	ALL	SPEED	SUR	51	1	2	4.2	5.8	7.2
OYCZ	ALL	SPEED	SUR	31	3	10	8.7	13.4	15.9
PCKU	ALL	SPEED	SUR	42	2	5	9.0	6.0	10.9
P3NJ5	ALL	SPEED	SUR	58	0	0	2.2	5.3	5.8
VRUZ7	ALL	SPEED	SUR	23	1	4	7.7	9.4	12.2
3FEI6	ALL	SPEED	SUR	26	0	0	2.8	5.0	5.7
3FFE8	ALL	SPEED	SUR	37	0	0	3.9	6.1	7.2
3FTW	ALL	SPEED	SUR	38	1	3	4.4	10.9	11.8
44138	ALL	SPEED	SUR	23	0	0	1.9	-15.3	15.4
9KKF	ALL	SPEED	SUR	30	0	0	6.2	5.0	8.0
9KKS	ALL	SPEED	SUR	65	0	0	2.2	-5.1	5.5
9MBQ4	ALL	SPEED	SUR	30	0	0	5.2	6.8	8.6
9MUG	ALL	SPEED	SUR	43	3	7	5.8	9.0	10.7
WIND DIRECTION									
ELVH7	ALL	DIRN.	SUR	42	0	0	118.9	-25.0	121.5
PJOX	ALL	DIRN.	SUR	20	1	5	52.4	30.8	60.8
46147	ALL	DIRN.	SUR	570	0	0	18.9	-31.1	36.4

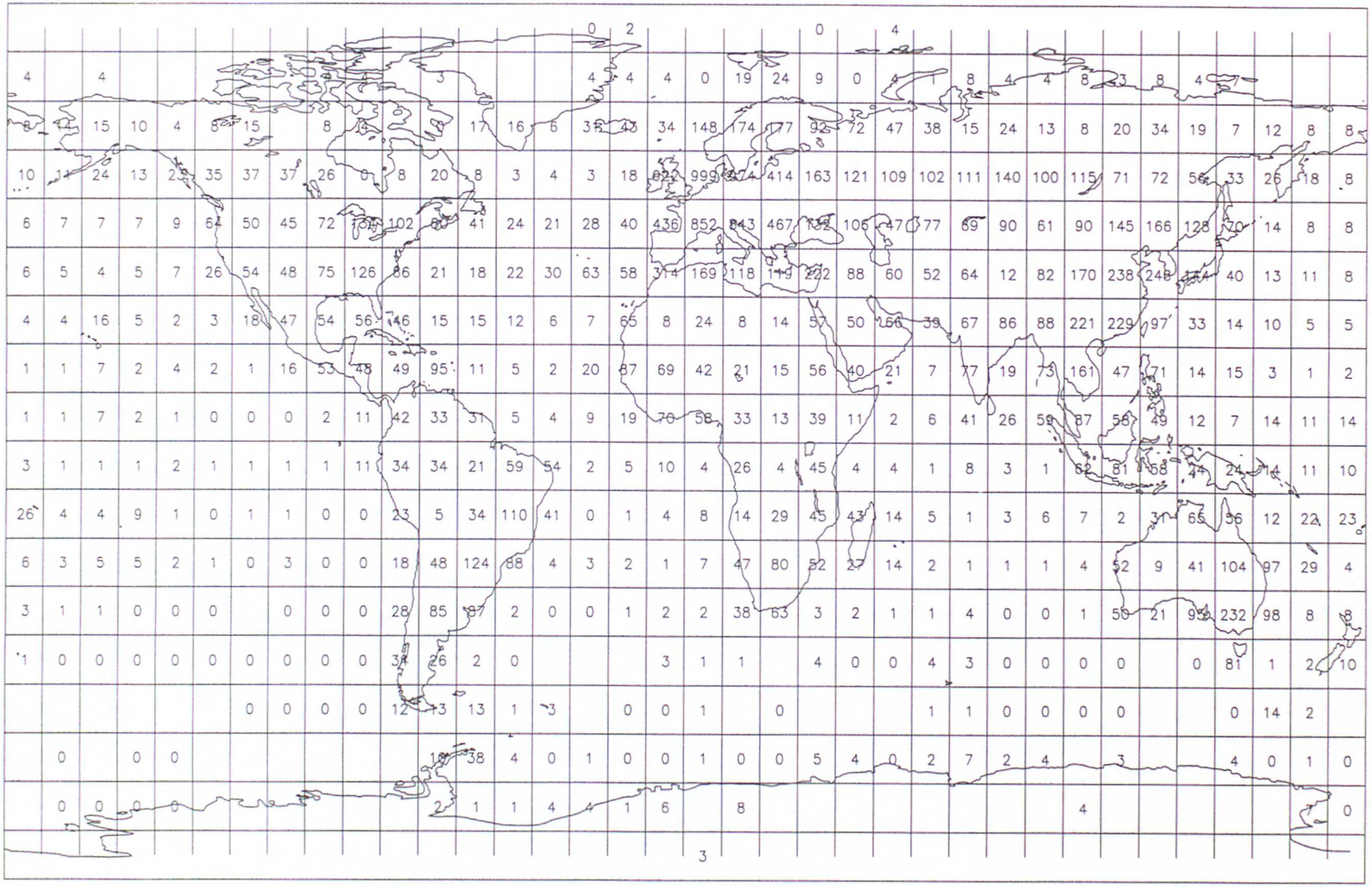
AVAILABILITY – SHIP/SYNOP – JANUARY 1999

FIGURE 1

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20722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10 11 24 13 23 35 37 37 26 0 8 20 8 3 4 3 18 822 999 574 414 163 121 109 102 111 140 100 115 71 72 56 33 26 18 8
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6 5 4 5 7 26 54 48 75 126 86 21 18 22 30 63 58 314 169 118 149 222 88 60 52 64 12 82 170 238 248 144 40 13 11 8
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1 1 7 2 4 2 1 16 53 48 49 95 11 5 2 20 87 69 42 21 15 56 40 21 7 77 19 73 161 47 71 14 15 3 1 2
1 1 7 2 1 0 0 0 2 11 42 33 31 5 4 9 19 70 58 33 13 39 11 2 6 41 26 59 87 58 49 12 7 14 11 14
3 1 1 1 2 1 1 1 1 11 34 34 21 59 54 2 5 10 4 26 4 45 4 4 1 8 3 1 62 81 58 44 24 14 11 10
26 4 4 9 1 0 1 1 0 0 23 5 34 110 41 0 1 4 8 14 29 45 43 14 5 1 3 6 7 2 31 65 56 12 22 23
6 3 5 5 2 1 0 3 0 0 18 48 124 88 4 3 2 1 7 47 80 52 27 14 2 1 1 1 4 52 9 41 104 97 29 4
3 1 1 0 0 0 0 0 0 28 85 87 2 0 0 1 2 2 38 63 3 2 1 1 4 0 0 1 50 21 95 232 98 8 8
1 0 0 0 0 0 0 0 0 0 34 26 2 0 3 1 1 4 0 0 4 3 0 0 0 0 0 81 1 2 10
0 0 0 0 12 13 13 1 3 0 0 1 0 1 1 0 0 0 0 0 14 2
0 0 0 10 38 4 0 1 0 0 1 0 0 5 4 0 2 7 2 4 3 4 0 1 0
0 0 0 0 2 1 1 4 4 1 6 8 4 7 0
3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from Bracknell global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1}	(pressure) (vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa ≥ 5 m s^{-1} ≥ 30 degrees	(pressure), (wind speed), (direction).
	2.SD	≥ 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
17545	-37.1	-12.3	ALL	P	SUR	298	0	0	1.8	-5.3	5.6
33538	-45.7	-51.6	ALL	P	SUR	223	45	20	6.0	-0.1	6.0
44925	53.8	-25.4	ALL	P	SUR	39	16	41	8.4	-3.8	9.2
46913	53.4	-145.9	ALL	P	SUR	92	87	95	3.6	9.3	10.0
46929	30.4	-132.7	ALL	P	SUR	126	6	5	3.9	-9.5	10.3
56547	-39.1	84.7	ALL	P	SUR	62	12	19	4.3	5.5	7.0
62518	43.9	-13.6	ALL	P	SUR	71	71	100	0.0	0.0	0.0
64528	66.1	6.6	ALL	P	SUR	114	113	99	0.0	1.7	1.7
WIND SPEED											
21531	38.1	-159.4	ALL	SPEED	SUR	523	0	0	3.3	-7.4	8.1
41522	14.7	-79.4	ALL	SPEED	SUR	118	36	31	6.9	9.8	11.9
41599	25.5	-38.3	ALL	SPEED	SUR	130	55	42	6.1	15.9	17.0
41633	15.8	-60.4	ALL	SPEED	SUR	50	0	0	2.6	-6.8	7.3
WIND DIRECTION											
44602	56.8	-27.2	ALL	DIRN.	SUR	82	1	1	29.8	78.1	83.6
46535	36.1	-132.9	ALL	DIRN.	SUR	283	0	0	88.4	23.2	91.4
46560	39.6	-130.4	ALL	DIRN.	SUR	316	0	0	50.1	-76.7	91.6
52540	13.4	144.7	ALL	DIRN.	SUR	50	0	0	58.5	53.2	79.0
55587	-40.1	165.7	ALL	DIRN.	SUR	415	0	0	41.7	51.6	66.3

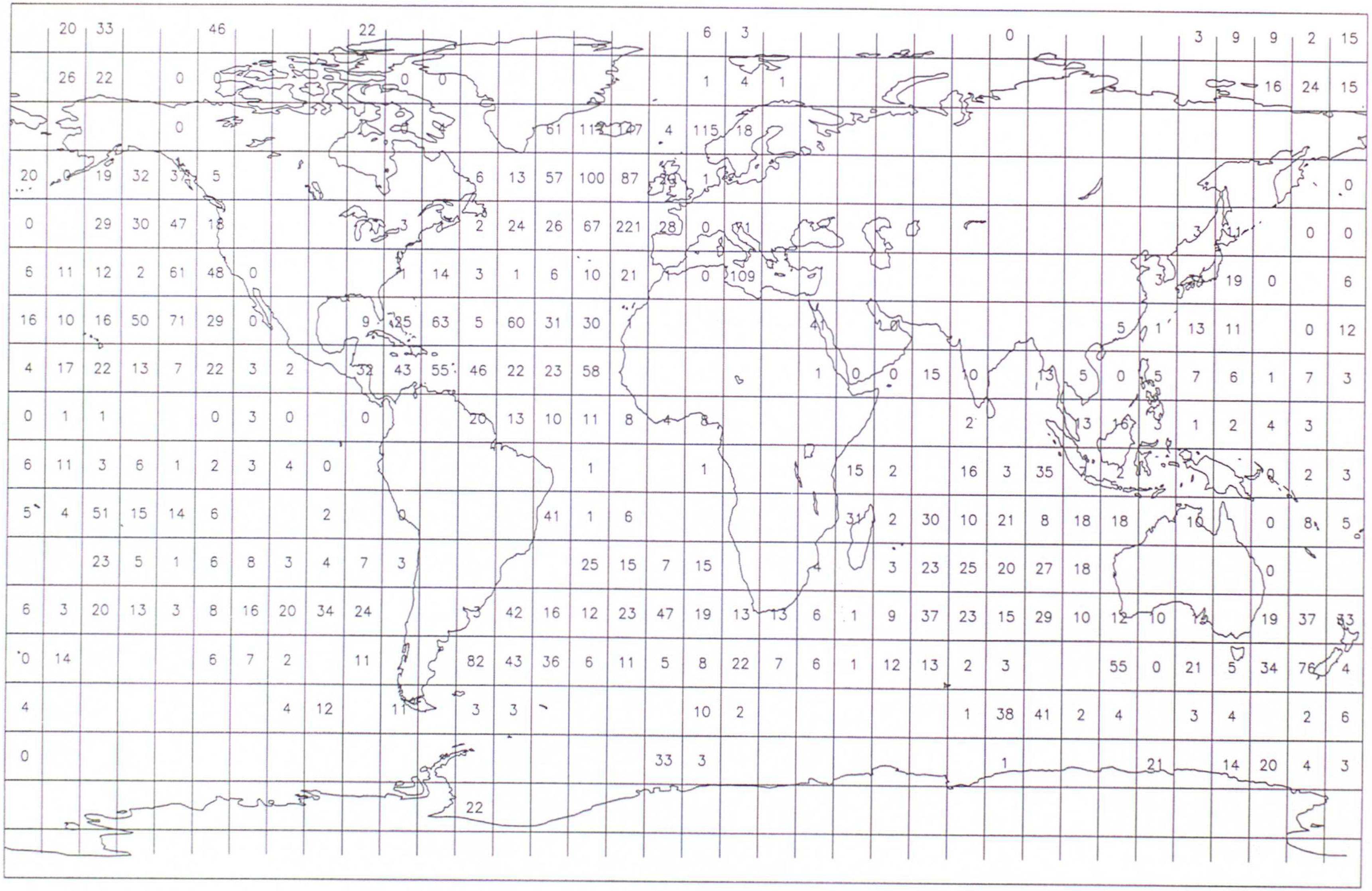
AVAILABILITY – DRIFTER – JANUARY 1999

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5164

FIGURE 2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26 22 0 0 0 0 1 4 1 16 24 15
0 0 61 113 147 4 115 18
20 0 19 32 37 5 6 13 57 100 87 29 1 0
0 29 30 47 18 3 2 24 26 67 221 28 0 11 3 1 0 0
6 11 12 2 61 48 0 1 14 3 1 6 10 21 1 0 109 3 19 0 6
16 10 16 50 71 29 0 9 25 63 5 60 31 30 1 41 5 1 13 11 0 12
4 17 22 13 7 22 3 2 32 43 55 46 22 23 58 1 0 0 15 10 13 5 0 5 7 6 1 7 3
0 1 1 0 3 0 0 20 13 10 11 8 4 8 2 13 16 3 1 2 4 3
6 11 3 6 1 2 3 4 0 1 1 15 2 16 3 35 2 0 2 3
5 4 51 15 14 6 2 0 41 1 6 31 2 30 10 21 8 18 18 10 0 8 5
23 5 1 6 8 3 4 7 3 25 15 7 15 4 3 23 25 20 27 18 0
6 3 20 13 3 8 16 20 34 24 3 42 16 12 23 47 19 13 13 6 1 9 37 23 15 29 10 12 10 13 19 37 33
0 14 6 7 2 11 82 43 36 6 11 5 8 22 7 6 1 12 13 2 3 55 0 21 5 34 76 4
4 4 12 11 3 3 10 2 1 38 41 2 4 3 4 2 6
0 33 3 1 21 14 20 4 3
22

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	119	1	1	0	0.8	4.7	4.8
60468	35.6N	6.2E	1052	S8	88	88	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	117	100	85	0	0.7	14.4	14.4
60535	34.7N	3.3E	1144	S8	86	0	0	0	0.8	-6.6	6.6
60571	31.6N	2.2W	773	S8	116	0	0	1	1.2	-4.4	4.6
60670	24.6N	9.5E	1054	S8	110	2	2	0	0.9	9.5	9.5
63330	13.5N	39.5E	2070	MS	58	57	98	0	0.0	11.5	11.5
63333	11.1N	39.7E	1903	MS	57	0	0	18	1.5	4.3	4.6
63334	10.3N	37.7E	2515	MS	80	0	0	0	0.8	10.9	10.9
63402	7.7N	36.8E	1725	MS	66	3	5	0	0.9	8.0	8.1
63450	9.0N	38.8E	2354	MS	84	2	2	1	0.8	5.6	5.7
63471	9.6N	41.9E	1260	MS	104	2	2	1	2.0	10.8	11.0
63478	5.9N	43.6E	295	MS	61	0	0	0	0.9	7.1	7.2
63602	3.1N	30.9E	1204	S	23	22	96	0	0.0	3.0	3.0
68343	27.6S	25.6E	1228	S8	101	0	0	64	1.1	-8.8	8.9
68396	26.5S	31.3E	641	S8	50	0	0	0	0.9	4.4	4.5
69679	43.9N	18.3E	1557	M	55	55	100	0	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	MS	115	0	0	24	3.0	5.5	6.3
24266	67.6N	133.4E	138	MS	118	0	0	6	2.5	4.3	5.0
24382	66.4N	143.2E	196	MS	60	0	0	3	2.3	4.7	5.2
24671	63.9N	135.9E	402	MS	122	6	5	2	3.0	10.0	10.4
24688	63.3N	143.2E	741	MS	119	22	18	18	5.2	4.7	7.0
25621	64.0N	158.9E	683	MS	118	0	0	36	5.5	4.3	7.0
30253	57.9N	114.2E	275	MS	115	0	0	8	3.6	5.1	6.2
30320	56.9N	105.7E	669	MS	110	55	50	0	2.2	2.2	3.1
30372	56.9N	118.3E	711	MS	122	10	8	27	4.7	4.9	6.8
30521	54.8N	105.2E	426	MS	92	0	0	21	3.1	4.4	5.4
30549	54.2N	112.0E	1302	S8	60	1	2	20	2.7	-4.1	4.9
30554	54.5N	113.6E	995	MS	121	3	2	41	3.8	6.0	7.1
30664	53.5N	115.6E	811	MS	30	0	0	0	1.3	-5.3	5.5
30741	52.8N	110.0E	1286	S8	116	3	3	29	2.8	-4.3	5.1
30815	51.5N	103.6E	1442	S8	58	0	0	24	1.7	-4.4	4.7
31123	57.8N	130.9E	255	MS	61	1	2	38	3.0	6.9	7.5
31474	51.6N	133.3E	384	MS	119	0	0	10	2.8	6.3	6.9
31532	50.9N	132.3E	272	MS	123	0	0	45	1.8	5.1	5.4
36428	49.2N	84.5E	401	MS	121	0	0	8	3.1	4.0	5.1
38343	42.9N	72.8E	683	M	111	0	0	8	2.2	4.0	4.6
40743	36.2N	57.7E	941	MS	108	0	0	0	0.9	-4.9	5.0
40762	35.3N	59.2E	1333	MS	110	31	28	0	1.0	-13.4	13.4
41254	23.1N	57.7E	1755	S8	90	90	100	0	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	22	0	0	0	1.0	7.4	7.5
41535	34.2N	73.3E	1308	8	49	0	0	2	1.9	-6.5	6.8
44212	50.0N	92.1E	940	MS	116	2	2	15	2.8	4.3	5.1
44239	48.8N	103.6E	1209	MS	112	0	0	1	2.3	-5.7	6.1
44256	49.6N	114.4E	706	MS	105	1	1	15	2.4	-5.5	6.0
44275	46.8N	98.1E	2255	MS	112	1	1	4	2.5	-5.0	5.6
44294	47.3N	107.5E	1429	MS	113	6	5	4	1.9	-4.3	4.7
44341	45.8N	106.3E	1396	MS	117	0	0	0	1.4	-4.5	4.7
44347	44.4N	105.3E	1297	MS	117	0	0	0	1.7	-4.0	4.3
44416	28.6N	81.6E	720	MS	64	1	2	0	1.2	4.8	4.9
44477	27.0N	87.4E	1445	S8	67	67	100	0	0.0	0.0	0.0
47016	41.4N	128.2E	715	M	104	0	0	8	3.3	4.8	5.8
47022	40.8N	128.2E	1200	S	55	2	4	20	1.1	4.6	4.7
51288	45.4N	90.5E	1651	S	122	0	0	0	1.5	-4.8	5.0
51334	44.6N	82.9E	321	M	123	2	2	50	3.5	9.0	9.7
51379	44.0N	89.6E	794	M	122	0	0	45	2.9	8.2	8.7
51495	43.5N	91.6E	874	M	122	11	9	80	2.7	11.2	11.5

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
51818	37.6N	78.3E	1376	M	123	1	1	26	3.2	5.2	6.1
52602	38.8N	93.4E	2734	S	123	0	0	0	1.8	-6.3	6.6
52866	36.6N	101.8E	2262	S	123	0	0	0	1.4	-6.3	6.5
53083	44.6N	114.2E	1183	M	123	0	0	52	3.0	5.6	6.4
53352	41.7N	110.4E	1377	M	123	0	0	55	3.6	5.5	6.6
53480	41.0N	113.1E	1416	M	122	0	0	34	3.0	4.2	5.2
53588	39.0N	113.5E	2898	S	120	120	100	0	0.0	0.0	0.0
54386	41.4N	128.2E	1018	M	122	0	0	7	3.5	7.2	8.0
54587	39.1N	123.2E	-69	M	88	0	0	1	1.5	-4.7	4.9
56021	34.1N	95.8E	4176	S	123	0	0	0	1.4	-5.8	6.0
56144	31.8N	98.6E	3184	S	86	1	1	2	2.1	-8.5	8.8
56385	29.5N	103.3E	3049	S	123	1	1	8	2.4	-9.6	9.9
56444	28.5N	98.9E	3488	S	122	4	3	0	0.7	13.5	13.5
56462	29.0N	101.5E	2994	S	119	1	1	0	1.8	7.4	7.6
56954	22.6N	99.9E	1054	M	123	0	0	7	2.2	5.0	5.5
58437	30.1N	118.2E	1836	S	121	0	0	36	1.3	-4.5	4.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	43	0	0	2	1.4	-6.0	6.2
82704	7.6S	72.7W	170	MS	80	0	0	0	1.6	-4.6	4.9
83186	11.2S	40.5W	485	MS	68	0	0	46	1.9	-5.3	5.6
83214	10.3S	54.9W	285	MS	24	0	0	0	1.3	-6.7	6.8
83235	12.4S	46.4W	604	MS	85	0	0	4	1.6	6.3	6.5
83319	14.7S	52.4W	315	MS	73	0	0	0	1.2	-4.9	5.0
83332	14.1S	46.4W	826	MS	87	5	6	0	0.9	13.3	13.3
83408	14.3S	43.8W	447	MS	76	0	0	0	0.9	10.1	10.1
83423	16.7S	49.3W	741	MS	88	1	1	0	1.0	-6.1	6.2
83531	18.6S	46.5W	940	MS	82	0	0	0	1.0	-6.8	6.9
83587	19.9S	43.9W	850	MS	82	0	0	0	0.9	-7.0	7.1
84401	5.2S	80.6W	49	MS	88	0	0	0	1.4	5.0	5.2
84455	6.5S	76.4W	281	MS	64	0	0	2	1.6	4.4	4.7
84472	7.1S	78.5W	2620	S	51	1	2	0	0.7	-6.6	6.6
84686	13.6S	72.0W	3248	S	88	0	0	0	1.1	-7.8	7.9
84735	15.5S	70.2W	3826	M	53	0	0	0	0.8	-5.1	5.2
84782	18.1S	70.3W	468	S	86	0	0	0	1.4	6.1	6.3
85406	18.3S	70.3W	55	M	118	0	0	0	1.1	4.1	4.2
85836	43.6S	71.8W	277	M	36	0	0	8	2.5	4.2	4.9

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70267	64.0N	145.7W	391	MS	113	0	0	3	2.2	4.9	5.4
70271	62.2N	145.5W	481	MS	84	0	0	33	3.6	7.1	8.0
71094	66.6N	61.6W	393	MS	119	0	0	0	1.6	-4.1	4.4
72475	38.4N	113.0W	1536	M	122	0	0	26	3.1	4.3	5.3
76113	30.7N	111.7W	419	MS	71	0	0	55	1.4	4.8	5.0
76118	30.4N	109.7W	1040	MS	33	1	3	6	1.0	-11.0	11.0
76632	20.1N	98.7W	2417	MS	37	0	0	0	0.8	-5.5	5.6
76658	19.2N	103.7W	494	MS	39	0	0	3	2.0	6.3	6.6
76698	19.6N	88.0W	20	MS	75	0	0	0	1.1	-4.1	4.2
76750	18.5N	88.3W	9	MS	79	0	0	42	1.6	-8.4	8.6
76775	17.1N	96.7W	1550	MS	39	0	0	0	1.2	4.5	4.7
76845	16.7N	92.6W	2276	MS	76	75	99	0	0.0	14.8	14.8
78718	14.4N	87.6W	626	MS	62	44	71	0	0.4	-14.4	14.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	238	238	100	0	0.0	0.0	0.0
94328	22.4S	133.6E	623	MS	89	0	0	0	0.8	6.2	6.3
94955	41.6S	145.7E	684	MS	118	118	100	0	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	121	121	100	0	0.0	0.0	0.0
96505	3.7N	115.7E	947	S	20	15	75	5	2.1	2.9	3.6
97700	3.3S	127.1E	20	M	51	1	2	65	2.9	-5.4	6.1

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02801	69.1N	20.8E	478	MS	91	0	0	37	2.6	4.0	4.8
04207	81.7N	59.9W	105	MS	115	0	0	1	1.7	-4.7	5.0
11146	47.1N	13.0E	3105	S7	90	0	0	12	1.3	-4.5	4.7
11180	47.7N	15.8E	1546	S8	115	0	0	10	1.4	-4.4	4.6
11213	46.6N	13.9E	495	MS	116	0	0	36	2.5	4.3	5.0
11231	46.6N	14.3E	448	MS	121	0	0	11	2.3	4.6	5.1
11343	47.1N	13.0E	3105	S	122	0	0	15	1.3	-4.2	4.4
12510	50.7N	15.7E	1603	S8	120	0	0	21	2.0	-4.5	4.9
13289	44.1N	21.9E	1037	8	123	0	0	21	1.9	-4.7	5.1
13369	43.3N	20.0E	1038	8	119	0	0	53	1.3	-4.1	4.3
15280	45.4N	25.4E	2504	S7	119	1	1	18	1.8	-4.5	4.8
16614	40.4N	21.3E	604	MS	96	0	0	1	1.2	-6.0	6.1
17092	39.8N	39.5E	1218	S8	122	0	0	0	1.2	8.8	8.9
17203	38.9N	40.5E	1177	S8	119	0	0	13	1.1	4.8	4.9

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	M	27	0	0	0	1.6	7.6	7.8
89345	81.7S	148.8W	620	S	339	101	30	17	3.0	-7.3	7.9

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	106	1	21	1.6	1.1	105	0	20	0	7.0	1.8
AAH	37	3	27	2.6	0.9	39	3	26	0	10.0	3.9
AAL	5538	0	22	1.8	0.0	5125	0	18	0	8.9	0.8
AAR	1287	0	5	2.2	-0.6	1264	0	6	0	9.0	0.1
ACA	1793	0	7	1.9	-0.1	1731	0	4	0	6.8	0.4
ACI	35	0	0	1.1	0.8	36	0	0	0	7.4	1.1
AEA	503	1	17	2.2	0.6	474	0	16	0	10.4	-0.4
AEL	1297	0	15	1.9	-0.5	1297	1	15	0	9.2	1.0
AEY	202	1	4	1.5	0.6	203	0	5	0	7.9	0.5
AFL	449	1	5	2.0	0.5	439	1	4	0	7.8	0.9
AFR	2177	1	11	1.7	-0.1	2170	0	11	0	8.6	0.8
AIH	212	0	7	1.5	0.0	210	0	7	0	9.5	0.5
AJM	122	0	3	1.6	-0.7	123	1	6	0	10.6	0.6
AMM	85	0	6	1.7	0.3	84	1	5	0	10.0	1.1
AMT	676	2	40	2.2	0.9	672	0	39	0	8.6	0.6
AMX	430	3	6	1.7	-0.1	432	0	6	0	10.3	0.9
ANA	1672	0	6	2.0	-0.1	1677	0	6	0	8.0	0.7
ANG	21	0	0	1.2	-0.7	21	0	0	0	5.0	1.0
ANZ	2747	1	24	1.7	-0.1	2703	0	23	0	7.8	0.7
AOM	1018	1	6	1.8	0.8	1020	0	6	0	8.1	0.9
ARG	58	7	22	2.7	0.4	57	0	16	0	11.7	0.1
AVA	473	1	2	1.9	-0.2	473	0	5	0	9.7	0.3
AVE	121	2	7	1.9	0.5	122	1	4	0	9.3	0.4
AVN	95	1	4	1.2	0.2	94	2	5	0	6.8	0.2
AZA	406	2	69	2.6	0.3	384	0	14	0	9.3	0.7
BAF	21	0	0	1.2	-0.2	21	0	0	0	7.1	3.2
BAL	663	0	15	1.9	-0.7	658	1	14	0	8.3	0.8
BAW	1749	1	16	2.0	-0.2	1689	1	14	0	8.5	0.7
BBB	33	0	6	2.0	-0.9	32	0	6	0	12.6	1.1
BLX	67	3	10	1.6	-0.3	69	0	10	0	11.0	2.4
BWA	429	1	11	2.0	1.1	413	0	8	0	8.6	0.7
CAL	1261	0	5	2.0	-0.3	1269	0	7	0	8.6	0.2
CCA	290	2	10	2.7	0.5	314	0	100	0	13.7	-0.7
CDN	2369	1	11	2.0	0.4	2302	0	10	0	8.9	0.6
CES	310	0	5	1.9	-0.1	318	2	11	0	12.2	-0.4
CFG	1284	1	5	1.9	-0.5	1256	0	4	0	8.6	0.4
CKS	339	1	35	1.7	0.6	347	1	37	0	9.1	0.9
CKT	221	2	10	1.9	0.8	216	0	8	0	10.0	0.9
CLX	324	0	5	2.1	-0.3	319	0	4	0	7.6	-0.3
CMI	443	1	4	1.8	0.9	446	0	5	0	8.6	1.5
CMM	442	1	12	2.0	-0.2	426	1	13	0	11.3	1.1
COA	1653	1	26	1.9	0.1	1568	0	24	0	11.1	1.6
CPA	77	3	4	2.2	-0.3	80	1	9	0	9.4	-0.3
CRL	995	1	8	1.6	0.1	981	0	8	0	7.9	1.0
CSN	98	0	6	2.2	0.9	99	1	7	0	8.2	0.6
CTB	263	0	2	1.7	-0.4	263	0	2	0	8.3	1.4
CTM	32	0	25	1.9	-0.6	32	0	25	0	9.4	0.9
CUB	544	0	6	1.9	0.7	543	1	7	0	9.5	0.7
DAL	4201	0	33	2.2	0.5	3963	0	31	0	8.3	0.9
DBY	728	1	3	1.8	-0.9	731	0	5	0	10.0	0.7
DLH	2477	0	13	1.9	0.0	2370	0	11	0	7.4	0.8
EEZ	46	0	20	1.9	-0.2	45	0	18	0	8.8	-0.4
EIA	201	1	30	1.3	0.6	197	0	31	0	10.0	2.5
ELY	127	2	9	2.1	0.0	129	0	8	0	9.0	0.9
EVA	2082	1	5	2.1	-0.3	2113	0	6	0	8.8	0.0
EWW	80	1	11	1.8	0.0	74	1	9	0	10.6	2.5
FDX	1613	1	17	1.9	0.3	1553	0	14	0	9.0	0.7
FIN	525	1	17	2.0	0.3	450	1	11	0	6.6	0.4

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FJI	947	3	24	1.8	0.5	915	0	21	0	7.2	1.5
FOM	143	3	23	1.5	-0.1	139	0	20	0	7.1	1.7
GAF	27	0	41	3.2	-1.7	26	0	38	0	6.7	1.4
GHA	60	2	2	1.5	-0.6	60	0	2	0	10.1	2.8
GIA	33	0	9	1.3	0.9	35	0	11	0	8.9	0.9
GRL	27	0	0	1.7	-0.3	27	0	0	0	5.4	0.4
GTI	67	1	10	2.4	0.1	69	0	9	0	10.0	1.4
HAL	3025	1	32	1.8	0.2	3005	0	33	0	9.6	1.4
HBI	20	0	25	1.9	-1.0	20	0	25	0	6.9	1.8
HLF	106	0	12	2.2	-0.9	99	1	6	0	7.9	1.0
HLQ	33	0	24	1.7	1.5	34	0	29	0	12.4	2.7
HRH	133	2	36	0.9	0.6	130	0	35	0	7.4	1.6
IBE	3054	1	19	2.0	0.4	2931	1	18	0	9.9	0.7
ICE	904	1	16	1.8	0.3	785	0	9	0	7.1	0.1
JAL	7067	0	5	2.0	0.1	7069	0	5	0	8.4	0.8
JKK	219	1	16	1.8	-0.2	193	0	9	0	10.6	1.6
KAL	3998	1	8	2.0	-0.5	3969	0	9	0	8.9	0.4
KLM	2899	0	13	1.7	0.1	2803	0	11	0	7.6	0.8
LAN	32	9	34	3.4	1.2	33	0	21	0	13.0	2.0
LAP	35	3	17	3.2	2.1	35	0	100	0	14.7	0.7
LDA	210	1	13	2.2	0.2	206	0	13	0	9.6	1.0
LDI	795	1	66	2.1	-1.0	747	1	19	0	10.2	0.3
LIB	450	0	5	1.7	0.9	456	0	6	0	9.6	0.5
LOB	21	43	76	5.7	4.2	20	0	40	0	4.1	0.0
LOT	82	0	20	2.3	-0.9	66	0	9	0	5.3	-0.2
LPR	21	5	5	2.9	1.1	21	0	10	0	14.0	4.5
LTU	765	1	15	1.9	-0.5	694	0	8	0	8.5	0.8
LXR	73	1	8	1.9	0.6	75	0	8	0	8.0	0.3
MAS	373	1	8	2.2	-0.3	398	0	7	0	8.5	1.0
MDA	106	0	1	1.9	-0.3	107	0	4	0	10.9	-2.2
MON	24	0	4	1.5	0.7	25	0	8	0	7.5	1.0
MPD	148	1	11	2.4	0.7	145	0	8	0	9.5	0.1
MPH	750	0	7	1.8	-0.5	744	0	7	0	8.5	0.4
NCA	481	1	4	1.9	0.3	481	0	5	0	8.8	1.1
NWA	10424	0	10	2.0	0.6	10285	0	10	0	8.5	0.6
PAC	155	1	25	1.9	0.4	145	1	23	0	9.2	0.2
PAL	912	0	7	1.8	-0.5	870	0	9	0	8.8	0.6
PAO	338	2	27	1.7	0.0	332	0	26	0	8.0	0.9
PAQ	22	0	0	1.4	0.3	21	0	0	0	8.0	2.8
QFA	1612	1	43	1.8	-0.1	1593	0	43	0	8.2	0.8
RAF	98	0	10	1.7	0.8	98	0	11	0	7.6	0.1
RAM	68	3	7	2.3	-0.7	68	3	7	0	10.4	1.1
RCH	426	2	24	2.3	0.5	404	0	25	0	12.4	1.4
RJA	24	0	0	1.8	0.2	25	0	4	0	10.8	0.6
RKA	88	1	2	1.5	-0.5	87	1	3	0	6.6	0.9
RRR	114	5	20	1.7	0.0	115	1	23	0	12.6	0.2
RYN	201	0	40	1.5	0.6	202	0	41	0	10.0	1.2
RZO	58	0	0	1.7	-0.6	58	0	0	0	7.2	1.7
SAA	307	0	2	1.8	-0.5	306	0	3	0	8.4	0.4
SAB	29	0	0	1.8	-0.3	28	0	0	0	10.1	2.8
SAS	1606	0	1	1.8	-0.1	1594	0	2	0	7.5	0.1
SCX	33	0	42	3.0	0.5	43	0	37	0	7.6	0.0
SEU	50	4	16	2.3	1.3	48	0	10	0	10.2	1.3
SIA	1041	0	5	2.1	-0.6	1035	0	5	0	9.1	0.4
SLR	198	0	14	2.0	-0.5	198	1	15	0	8.7	0.9
SOL	68	0	3	1.0	0.6	68	0	4	0	9.2	2.0
SVA	79	1	8	2.1	0.0	82	2	10	0	10.1	0.1
SVV	22	0	9	3.4	-1.1	21	0	5	0	9.1	0.8
SWR	97	4	27	2.7	-0.5	82	0	12	0	9.9	1.5

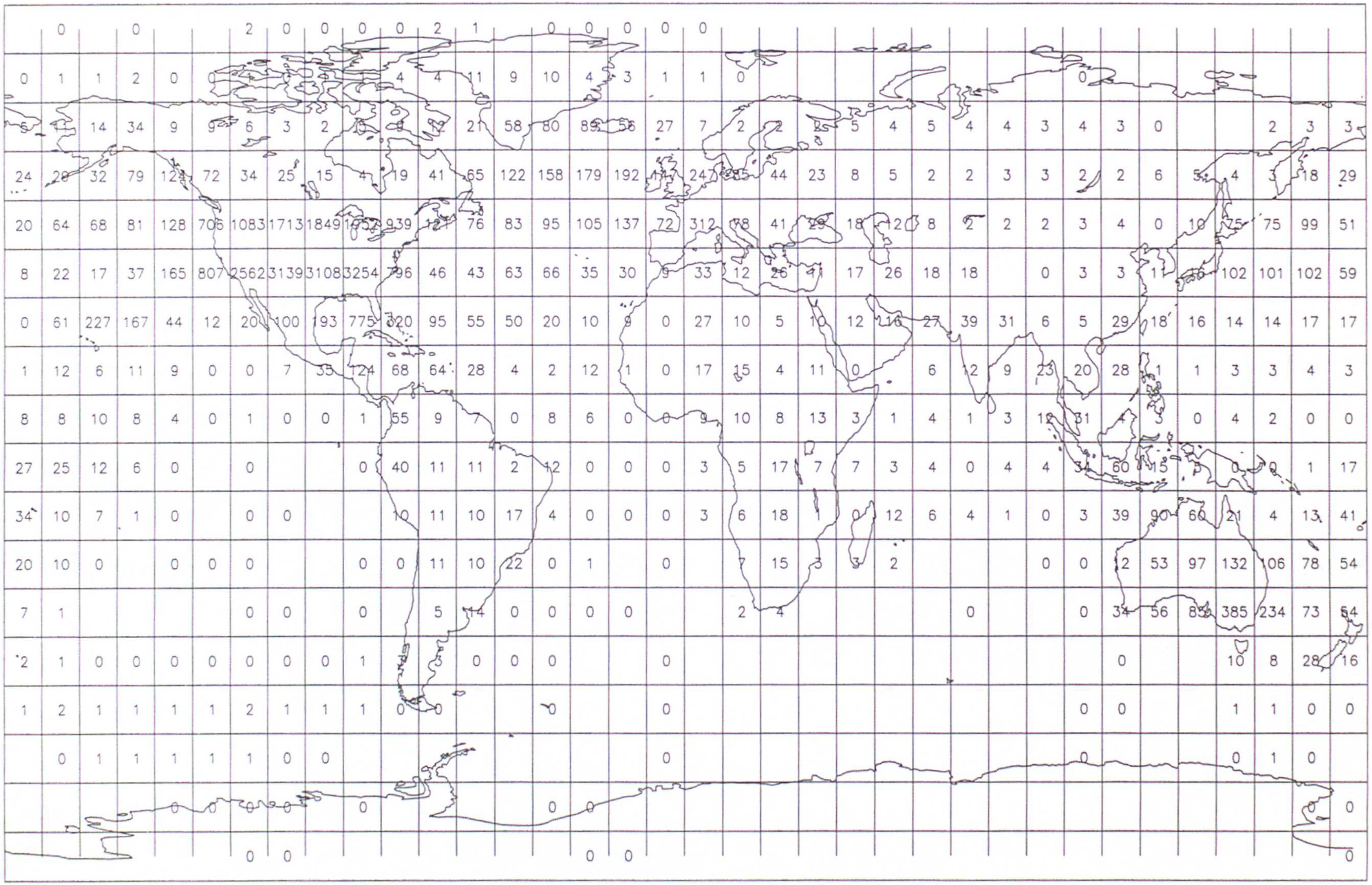
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAP	566	2	9	2.0	-0.5	561	1	10	0	10.1	1.1
TCO	31	0	0	2.0	-0.9	31	0	3	0	11.0	-2.9
THA	454	1	6	2.1	-0.9	457	1	8	0	9.6	-0.1
THT	128	1	20	1.9	0.8	125	0	21	0	7.2	1.3
TOW	98	0	19	2.1	0.2	88	0	17	0	10.8	0.2
TPA	30	0	3	1.2	-0.2	31	0	3	0	7.9	1.9
TSC	36	6	14	2.1	0.5	35	0	9	0	9.5	2.7
TWA	1295	1	23	2.2	0.3	1174	1	18	0	9.6	0.9
UAL	80627	1	86	1.6	-0.2	80954	0	86	0	7.3	0.6
UPS	1329	0	35	1.8	0.2	1264	0	33	0	7.4	1.0
USA	195	1	21	2.0	-0.2	168	0	12	0	9.6	1.0
VIR	293	0	6	1.9	-0.5	285	1	5	0	8.0	0.7
VKG	74	1	8	2.4	0.3	72	1	6	0	9.9	0.8
VPC	20	0	25	2.5	0.0	22	0	27	0	11.5	2.9
VRG	100	7	31	2.4	0.6	103	2	28	0	13.6	1.3
VSP	60	2	20	2.2	0.6	59	0	24	0	11.7	1.4
VVR	52	0	35	3.1	1.6	51	0	33	0	10.2	1.0
WOA	129	0	6	2.4	0.4	132	0	60	0	11.5	0.3
ZKN	1080	0	1	1.0	0.1	1080	0	1	0	6.4	0.9
AN	25044	0	1	1.2	0.2	25043	0	1	0	5.5	0.7
AR	3971	1	63	2.5	2.1	3967	0	30	0	7.2	1.5
BA	29008	0	3	1.6	0.3	28934	0	1	0	6.5	0.7
IT	373	0	56	1.3	0.3	371	0	56	0	6.1	0.0
KL	6686	0	7	1.5	0.6	6679	0	7	0	6.6	1.1
LH	981	0	1	1.9	1.0	1006	0	1	0	7.1	0.6
MK	2672	0	0	2.0	1.5	2663	0	1	0	8.2	1.5
QF	26184	0	6	1.4	0.5	26174	0	6	0	6.2	0.6
SA	3529	0	1	1.8	1.3	3529	0	0	0	7.3	0.7
SK	260	0	0	1.2	0.0	260	0	52	0	4.9	0.4
SV	1749	0	1	2.2	1.7	1727	0	44	0	6.4	1.1
UA	2613	1	29	1.8	0.0	2760	0	29	0	9.5	1.6
WA	569	6	11	2.1	0.7	567	4	100	0	13.9	-2.1
XX	4276	2	7	1.8	0.4	4938	0	100	0	12.6	0.7
N	730	2	30	2.7	0.4	715	0	24	0	8.3	0.4
ADS	2811	0	15	1.2	0.1	2811	0	15	0	6.0	0.2
US ACARS	545899	0	14	1.6	0.2	545754	0	15	0	6.9	0.8

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

JANUARY 1999

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3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24 28 32 79 124 72 34 25 15 4 19 41 65 122 158 179 192 117 247 285 44 23 8 5 2 2 3 3 2 2 6 5 4 3 18 29
20 64 68 81 128 706 1083 1713 1849 1952 939 121 76 83 95 105 137 72 312 78 41 29 18 12 8 2 2 2 3 4 0 10 75 75 99 51
8 22 17 37 165 807 2562 3139 3108 3254 796 46 43 63 66 35 30 9 33 12 26 41 17 26 18 18 0 3 3 11 16 102 101 102 59
0 61 227 167 44 12 20 100 193 775 320 95 55 50 20 10 9 0 27 10 5 10 12 16 27 39 31 6 5 29 18 16 14 14 17 17
1 12 6 11 9 0 0 7 35 124 68 64 28 4 2 12 1 0 17 15 4 11 0 6 12 9 23 20 28 1 1 3 3 4 3
8 8 10 8 4 0 1 0 0 1 55 9 7 0 8 6 0 0 9 10 8 13 3 1 4 1 3 12 31 4 3 0 4 2 0 0
27 25 12 6 0 0 0 40 11 11 2 12 0 0 0 3 5 17 7 7 3 4 0 4 4 34 60 15 0 0 1 17
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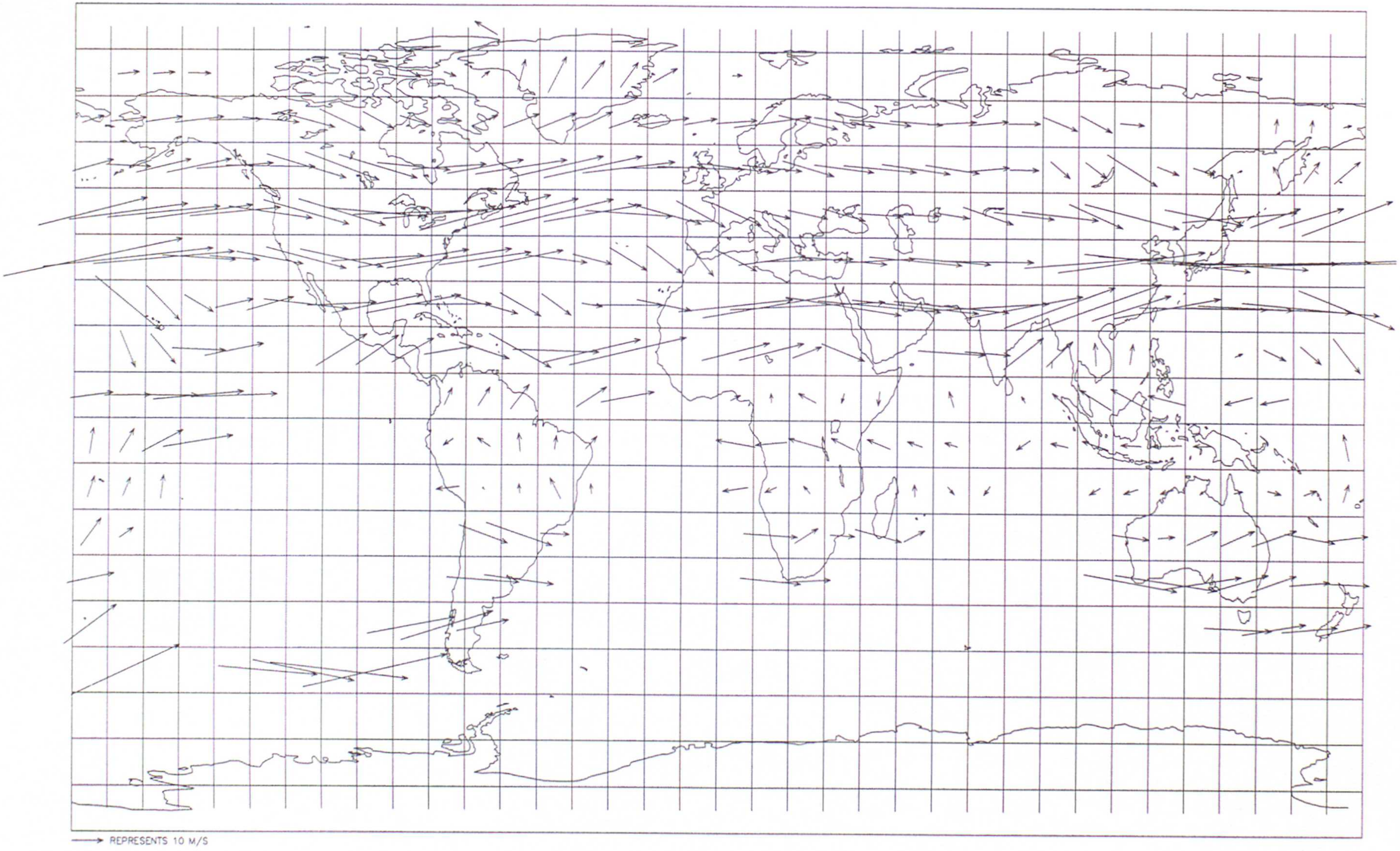
20 10 0 0 0 0 0 0 11 10 22 0 1 0 7 15 3 3 2 0 0 12 53 97 132 106 78 54
7 1 0 0 0 5 14 0 0 0 0 2 4 0 0 34 56 85 385 234 73 54
2 1 0 0 0 0 0 0 0 1 3 0 0 0 0 0 10 8 28 16
1 2 1 1 1 1 2 1 1 1 0 0 0 0 0 0 1 1 0 0
0 1 1 1 1 1 0 0 0 0 0 1 0
0 0 0 0 0 0 0 0 0
0 0 0 0 0

AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA
JANUARY 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4



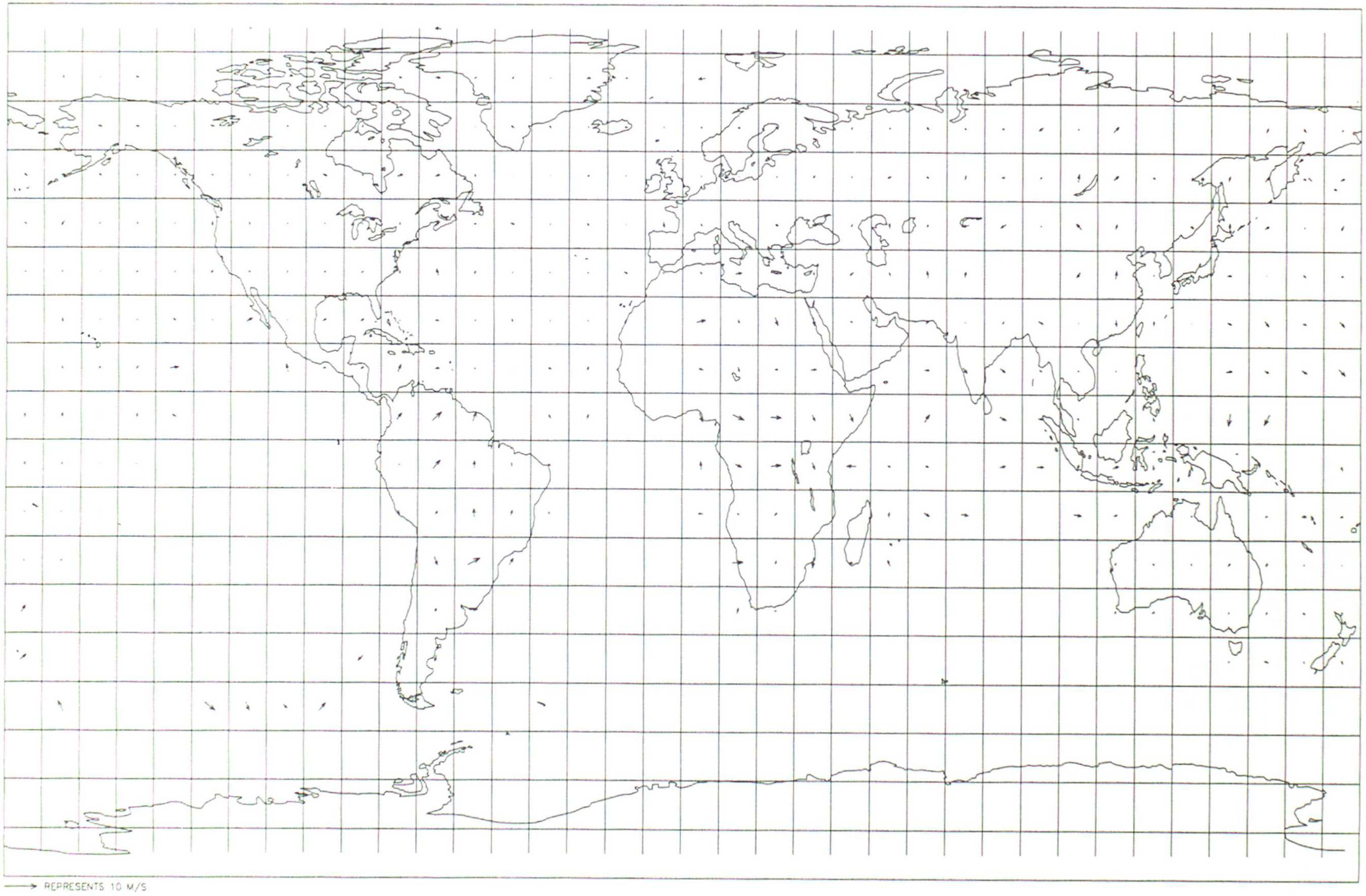
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

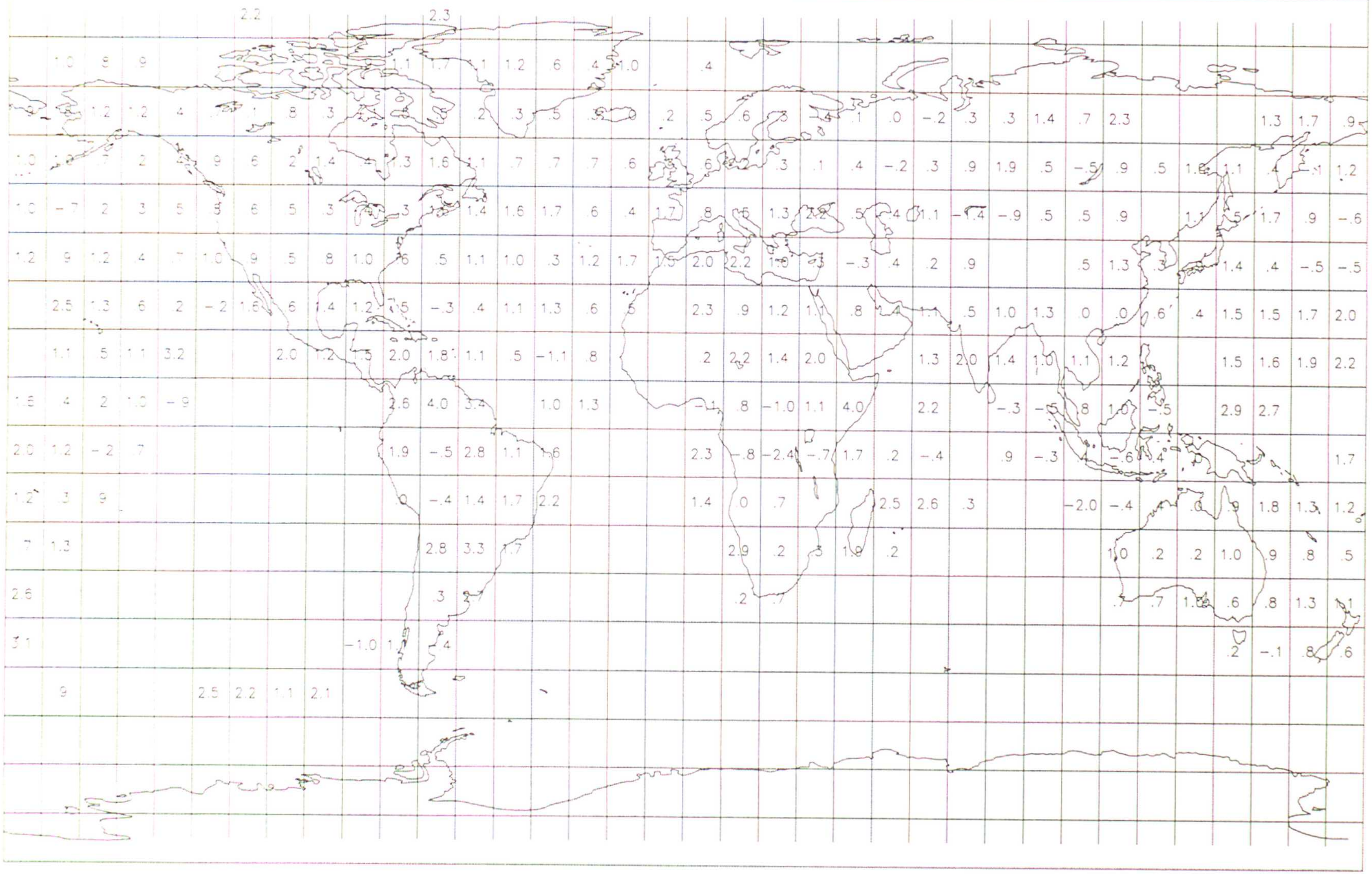
JANUARY 1999

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JANUARY 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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1.0 1.0 .7 .2 .4 .9 .6 .2 1.4 .4 1.3 1.6 1.1 .7 .7 .7 .6 .3 .6 .2 .3 .1 .4 −.2 .3 .9 1.9 .5 −.5 .9 .5 1.6 1.1 .4 −.1 1.2
1.0 −.7 .2 .3 .5 .5 .6 .5 .3 .4 .3 1.5 1.4 1.6 1.7 .6 .4 1.7 .8 .5 1.3 2.2 .5 .4 1.1 −1.4 −.9 .5 .5 .9 1.1 .5 1.7 .9 −.6
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2.5 1.3 .6 .2 −.2 1.6 .6 1.4 1.2 .5 −.3 .4 1.1 1.3 .6 .5 2.3 .9 1.2 1.1 .8 .4 1.1 .5 1.0 1.3 .0 .0 .6 .4 1.5 1.5 1.7 2.0
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1.5 .4 .2 1.0 −.9 2.6 4.0 3.4 1.0 1.3 −.1 .8 −1.0 1.1 4.0 2.2 −.3 −.5 .8 1.0 −.5 2.9 2.7
2.0 1.2 −.2 .7 1.9 −.5 2.8 1.1 1.6 2.3 −.8 −2.4 −.7 1.7 .2 −.4 .9 −.3 .4 −.6 .4 .0 1.7
1.2 .3 .9 .0 −.4 1.4 1.7 2.2 1.4 .0 .7 2.5 2.6 .3 −2.0 −.4 .4 .0 .9 1.8 1.3 1.2
.7 1.3 2.8 3.3 1.7 2.9 .2 .3 1.0 .2 1.0 .2 .2 1.0 .9 .8 .5
2.6 .3 2.7 .2 .7 .7 .7 1.0 .6 .8 1.3 1.1
3.1 −1.0 1.1 .4 .2 −.1 .8 .6
.9 2.5 2.2 1.1 2.1

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
JANUARY 1999
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

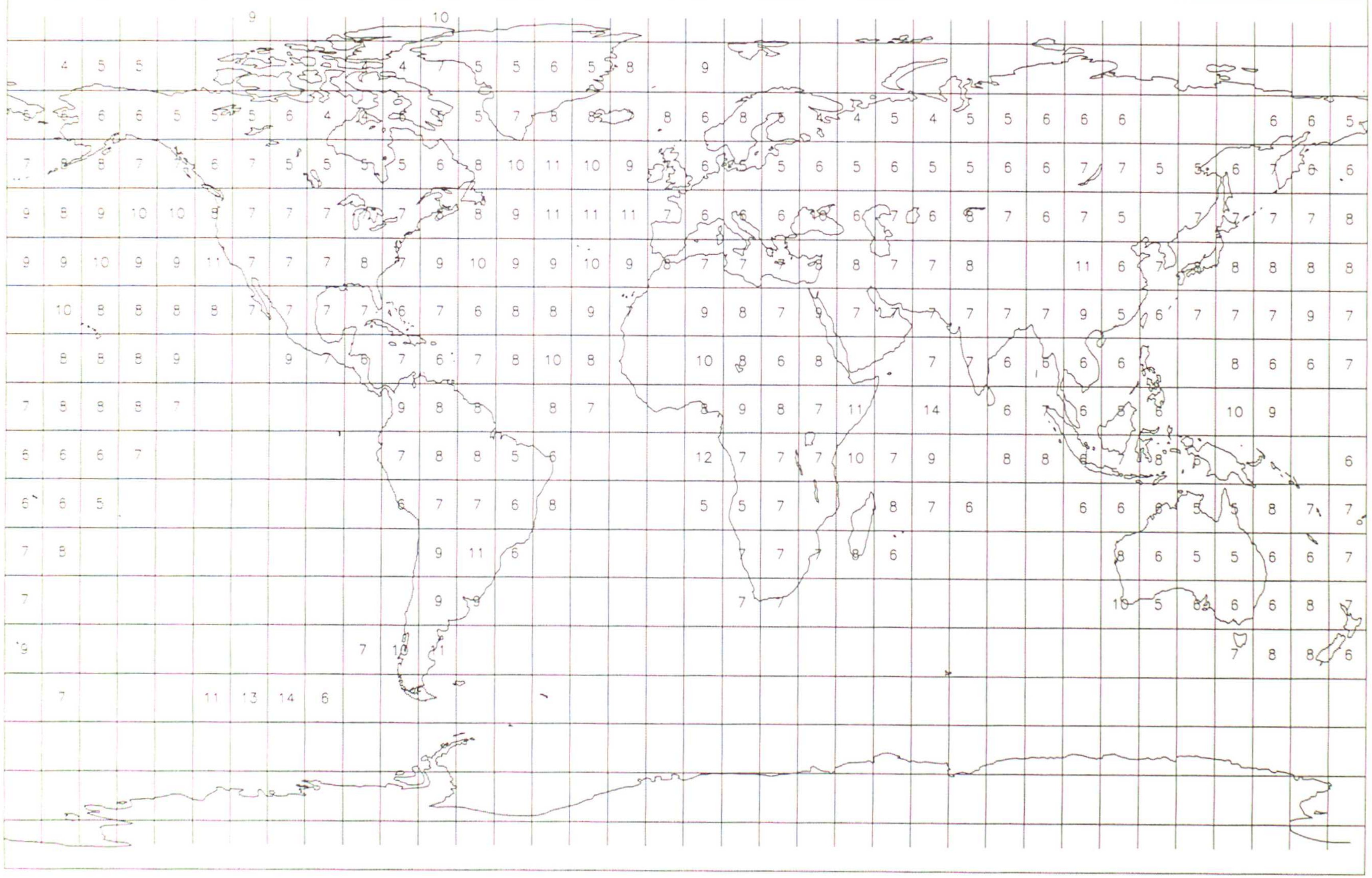


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26477	12	Z	200	56/ 31	27	1	45.1	98.9	108.7	5
27962	00	Z	200	53/ 45	29	0	76.7	68.3	102.7	5
33393	00	Z	200	50/ 24	12	0	47.1	96.1	107.0	4
33658	00	Z	100	48/ 26	11	0	33.8	139.9	143.9	4
42027	00	Z	100	34/ 75	10	1	102.8	-134.1	169.0	7
42027	12	Z	1000	34/ 75	20	0	30.8	17.6	35.5	4
42101	00	Z	200	30/ 76	23	0	68.0	-100.0	120.9	7
42101	12	Z	200	30/ 76	25	1	84.0	-46.6	96.0	7
42314	12	Z	100	27/ 95	16	0	71.9	-159.1	174.5	7
42339	12	Z	250	26/ 73	19	0	70.1	41.7	81.5	4
42369	00	Z	100	27/ 81	15	1	92.2	-106.4	140.8	4
42369	12	Z	100	27/ 81	16	1	122.0	-26.2	124.7	5
42397	00	Z	150	27/ 88	27	0	89.6	-100.8	134.8	10
42397	12	Z	200	27/ 88	27	0	67.4	-49.9	83.8	4
42647	12	Z	200	23/ 73	18	1	71.5	68.0	98.7	5
42874	12	Z	100	21/ 82	13	0	76.3	103.6	128.7	4
43003	12	Z	100	19/ 73	16	1	77.7	114.7	138.6	5
43128	00	Z	100	17/ 78	29	0	89.7	-76.5	117.9	5
43150	00	Z	250	18/ 83	29	0	53.1	-59.3	79.7	10
43185	00	Z	200	16/ 81	20	1	80.8	-45.4	92.7	6
43185	12	Z	150	16/ 81	25	0	104.0	74.4	127.9	5
43192	00	Z	150	15/ 74	24	1	65.9	-84.6	107.3	5
43285	12	Z	150	13/ 75	22	0	78.8	99.2	126.7	5
43295	00	Z	150	13/ 78	21	1	114.0	46.3	123.0	5
43295	12	Z	200	13/ 78	18	0	82.9	61.1	103.0	4
43311	00	Z	250	11/ 73	11	0	78.9	-10.8	79.6	4
43369	00	Z	100	8/ 73	19	1	100.5	-135.6	168.7	5
62306	12	Z	400	31/ 27	28	0	42.2	49.0	64.7	4
72376	00	Z	1000	37/-108	29	0	19.7	39.2	43.9	4
72376	12	Z	1000	37/-108	31	0	25.6	38.1	45.9	6
83746	12	Z	1000	-23/ -43	28	0	27.1	32.2	42.1	5
87418	12	Z	1000	-33/ -69	29	0	16.6	-35.7	39.4	4
89009	00	Z	1000	-90/ 0	6	19	14.3	77.3	78.7	5
89009	12	Z	1000	-90/ 0	6	17	14.9	78.0	79.4	4
89512	00	Z	1000	-71/ 12	13	14	8.8	90.8	91.3	10

AVAILABILITY - TEMP - 500 HPA GEOPOTENTIAL - JANUARY 1999 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1108

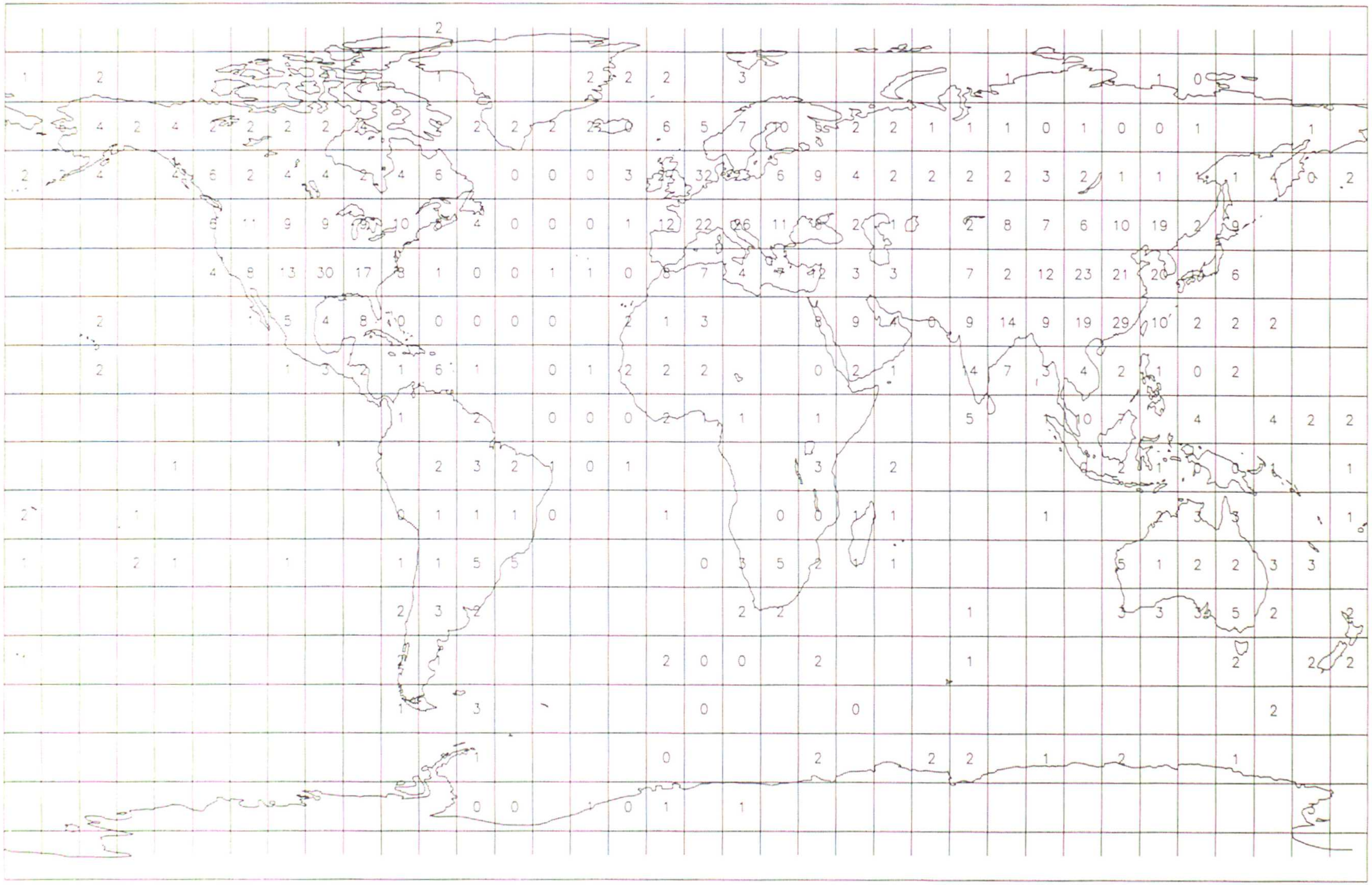


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix 1.2	
SELECTION CRITERIA	: ≥ 10 observations and > 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

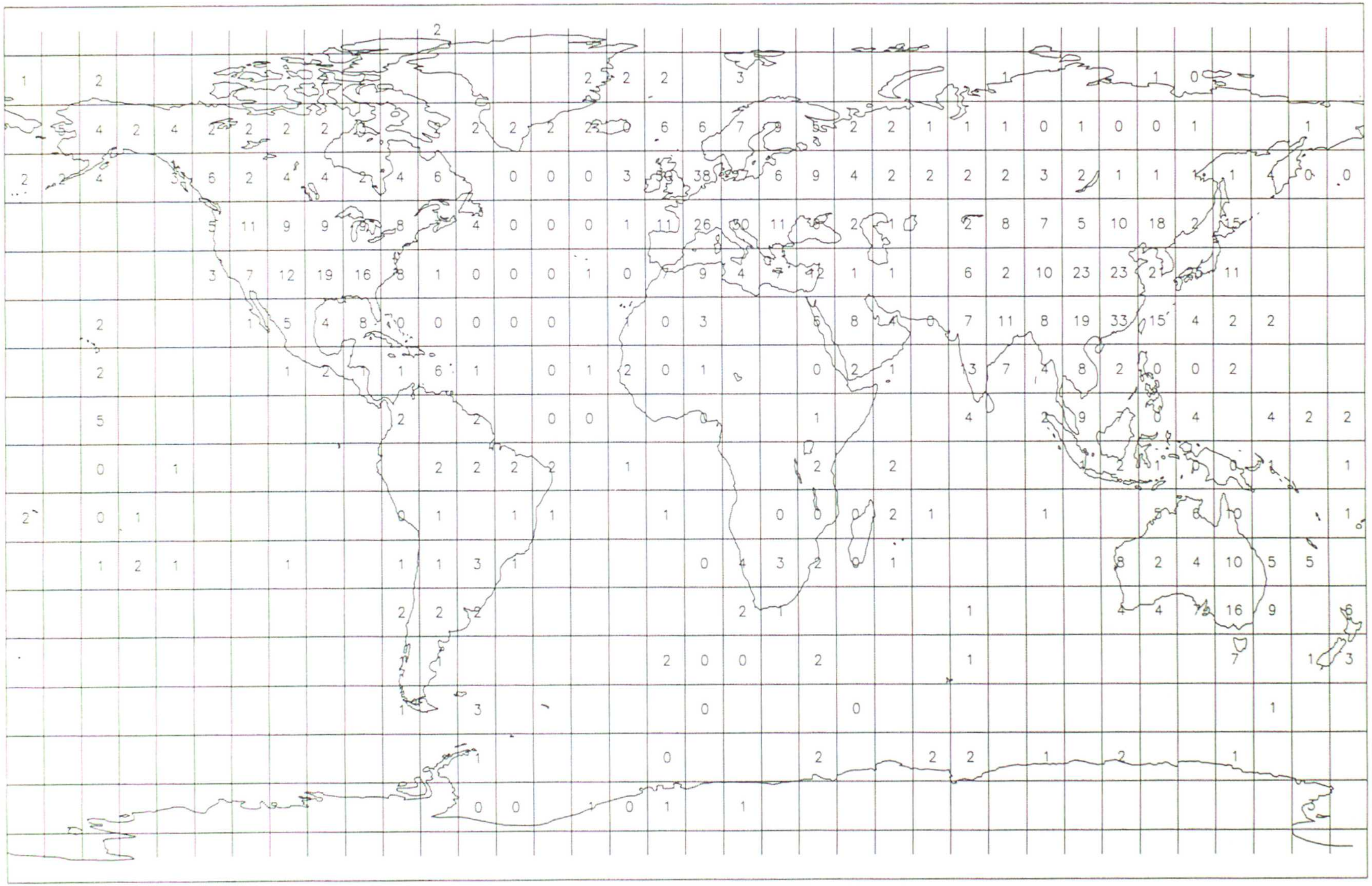
WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
42182	00	V	200	29/ 77	11	2	30	-9.9	23.6	19.7	2
42182	12	V	300	29/ 77	27	0	11	10.5	-1.5	16.7	3
42369	12	V	250	27/ 81	18	0	5	1.8	1.3	18.1	1
42397	12	V	150	27/ 88	24	0	0	-12.3	-4.2	17.3	2
42410	12	V	250	26/ 92	18	0	16	-6.3	-5.5	19.1	2
42701	00	V	250	23/ 85	16	0	25	14.5	0.8	19.4	1
53915	00	V	100	36/ 107	10	1	27	11.7	2.9	16.2	1
54497	00	V	200	40/ 124	29	0	10	-0.8	7.3	17.9	2
54497	12	V	250	40/ 124	28	1	17	-3.4	3.6	18.6	5
56691	00	V	100	27/ 104	16	0	25	5.3	4.0	15.5	1
62306	00	V	200	31/ 27	17	2	42	25.2	-0.8	27.7	2
62306	12	V	150	31/ 27	9	2	63	30.2	1.4	28.2	4
62378	12	V	200	30/ 31	20	1	14	-0.8	-1.6	16.2	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – JANUARY 1999 FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1190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3 7 12 19 16 8 1 0 0 0 1 0 7 9 4 7 12 1 1 6 2 10 23 23 21 25 11
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1 3 0 0 1
1 0 2 2 2 1 2 1
0 0 1 0 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
10828	00	DD	48/ 9	16	18.7	6.5	14.2
10828	12	DD	48/ 9	10	19.3	6.2	10.4
17240	00	DD	38/ 31	22	-10.5	7.5	14.8
21982	12	DD	71/-178	13	10.2	9.0	20.7
42339	00	DD	26/ 73	19	15.2	4.5	8.4
42339	12	DD	26/ 73	16	14.7	3.3	9.3
48327	12	DD	19/ 99	19	-10.6	6.6	22.0
48455	00	DD	14/ 101	21	12.4	3.5	20.7
50527	12	DD	49/ 120	27	12.3	2.7	15.1
60571	12	DD	32/ -2	17	10.5	4.4	19.5
62337	00	DD	31/ 34	25	-17.6	2.4	9.7
62337	12	DD	31/ 34	28	-16.8	5.7	9.6
76458	00	DD	23/-106	21	-10.6	6.4	17.2
80001	12	DD	13/ -82	15	14.5	8.1	25.1

MONITORING OF SATELLITE WINDS

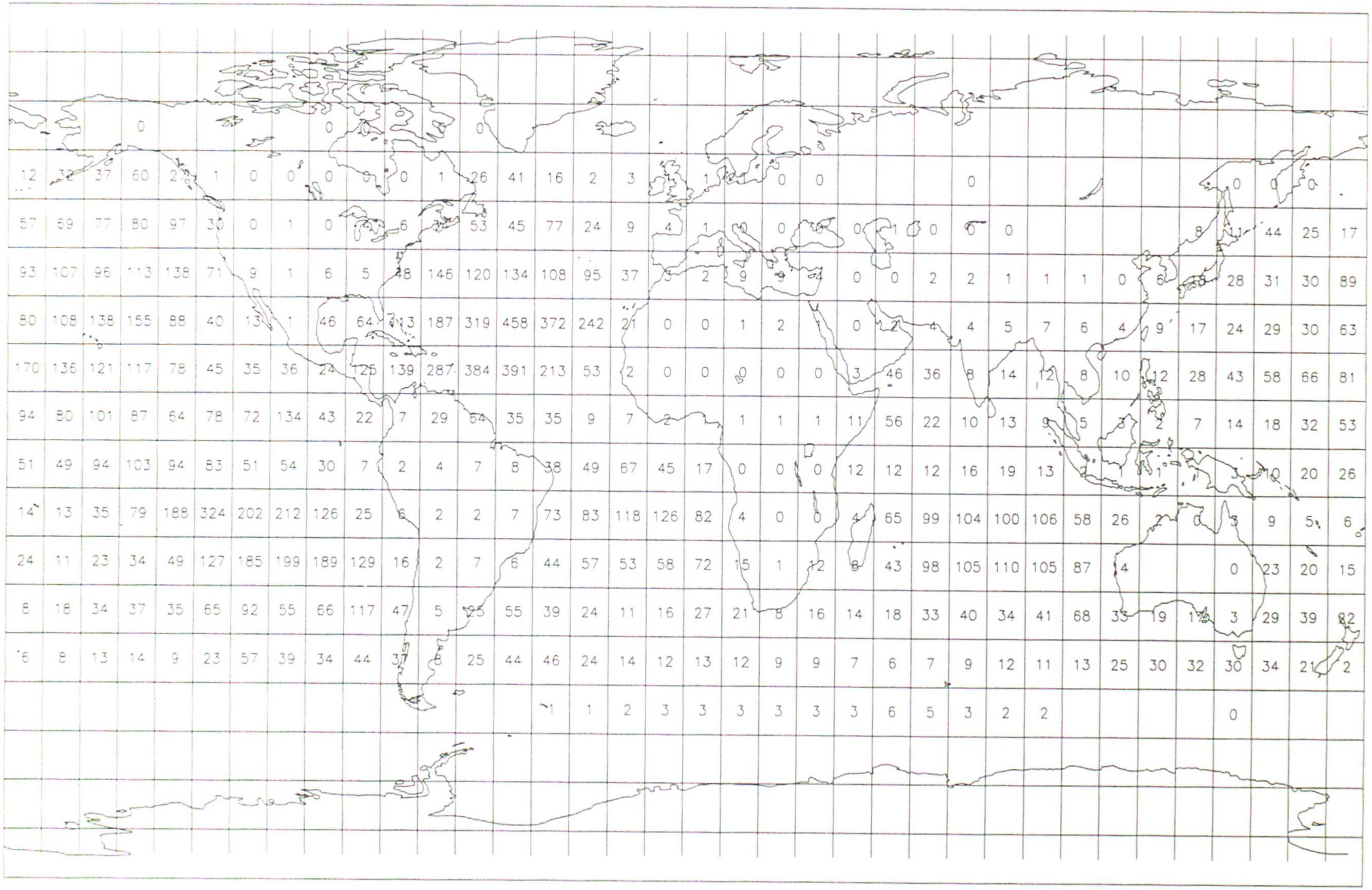
MONITORING CENTRE: BRACKNELL

MONTH: January 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JANUARY 1999


0 0 0
12 32 37 60 27 1 0 0 0 0 0 1 26 41 16 2 3 1 0 0 0 0 0 0
57 59 77 80 97 30 0 1 0 6 53 45 77 24 9 4 1 0 0 0 0 1 0 0 0 8 11 44 25 17
93 107 96 113 138 71 9 1 6 5 48 146 120 134 108 95 37 3 2 9 9 4 0 0 2 2 1 1 1 0 6 18 28 31 30 89
80 108 138 155 88 40 13 1 46 64 113 187 319 458 372 242 21 0 0 1 2 1 0 2 4 4 5 7 6 4 9 17 24 29 30 63
170 136 121 117 78 45 35 36 24 125 139 287 384 391 213 53 2 0 0 0 0 0 3 46 36 8 14 12 8 10 12 28 43 58 66 81
94 80 101 87 64 78 72 134 43 22 7 29 64 35 35 9 7 2 1 1 1 11 56 22 10 13 9 5 3 2 7 14 18 32 53
51 49 94 103 94 83 51 54 30 7 2 4 7 8 38 49 67 45 17 0 0 0 12 12 12 16 19 13 2 1 1 1 3 10 20 26
14 13 35 79 188 324 202 212 126 25 6 2 2 7 73 83 118 126 82 4 0 0 4 65 99 104 100 106 58 26 2 0 3 9 5 6
24 11 23 34 49 127 185 199 189 129 16 2 7 6 44 57 53 58 72 15 1 12 8 43 98 105 110 105 87 14 0 23 20 15
8 18 34 37 35 65 92 55 66 117 47 5 25 55 39 24 11 16 27 21 8 16 14 18 33 40 34 41 68 33 19 17 3 29 39 82
6 8 13 14 9 23 57 39 34 44 37 8 25 44 46 24 14 12 13 12 9 9 7 6 7 9 12 11 13 25 30 32 30 34 21 2
1 1 2 3 3 3 3 3 3 6 5 3 2 2 0

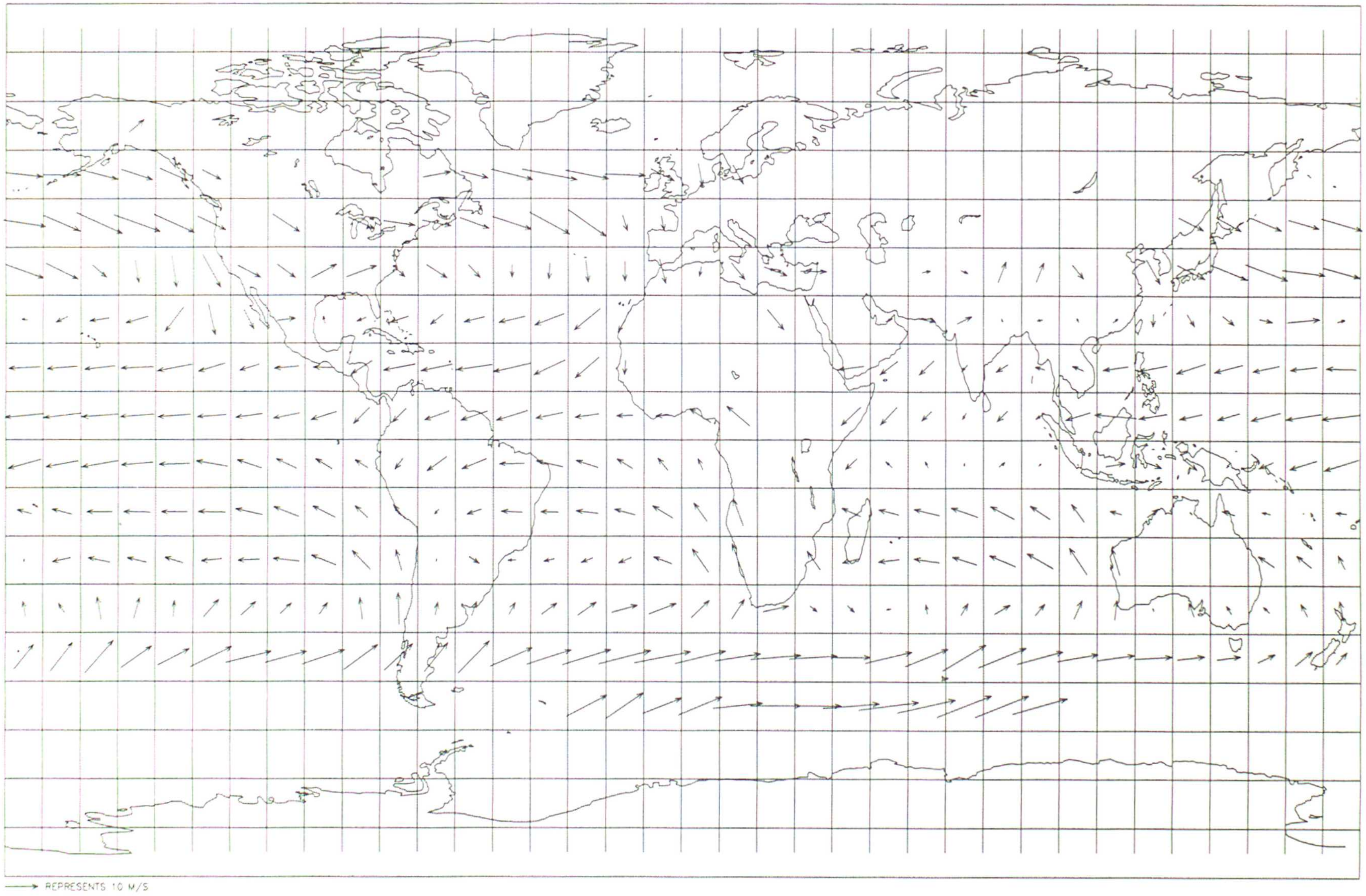
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

FIGURE 11

JANUARY 1999

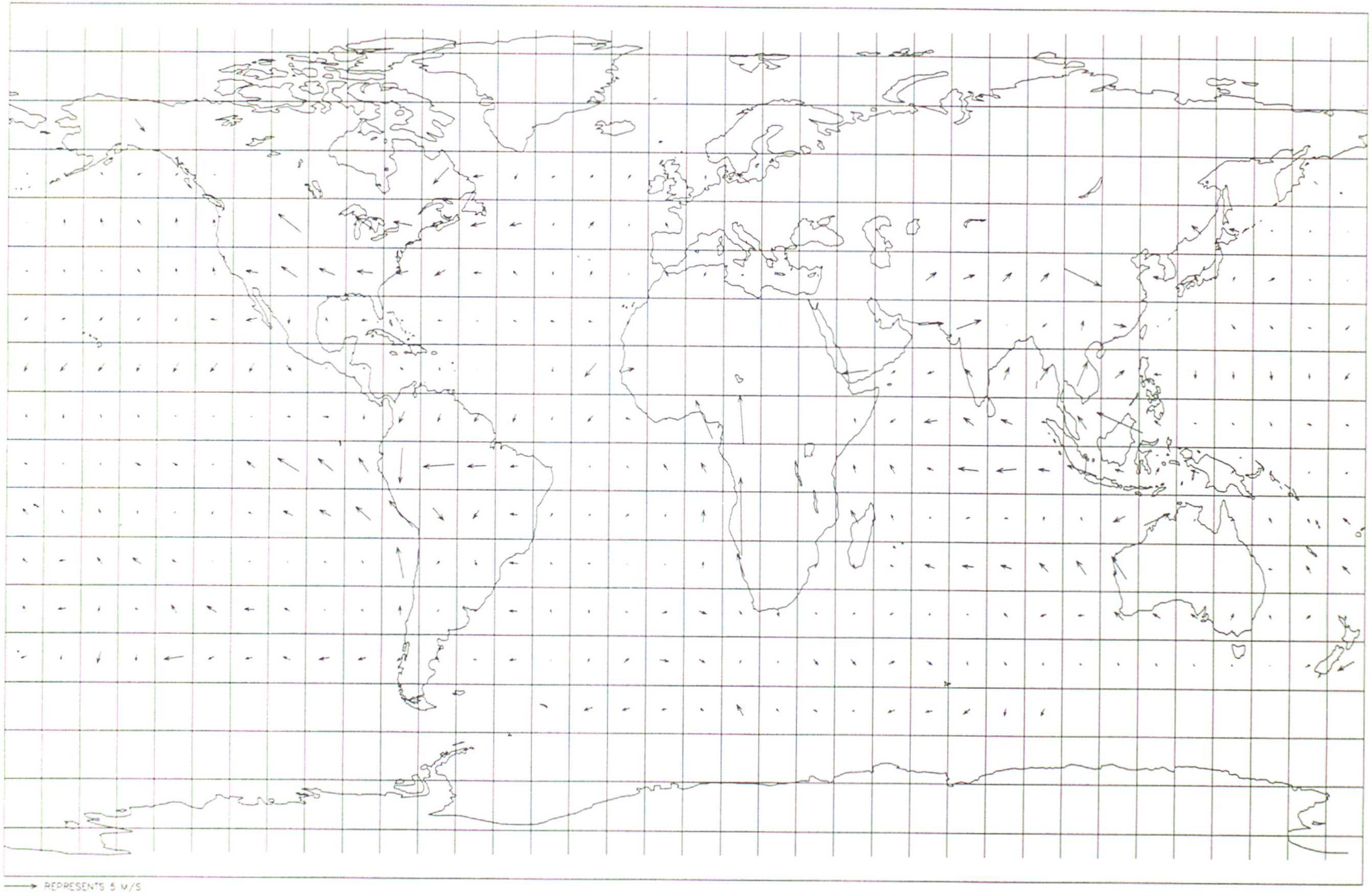
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

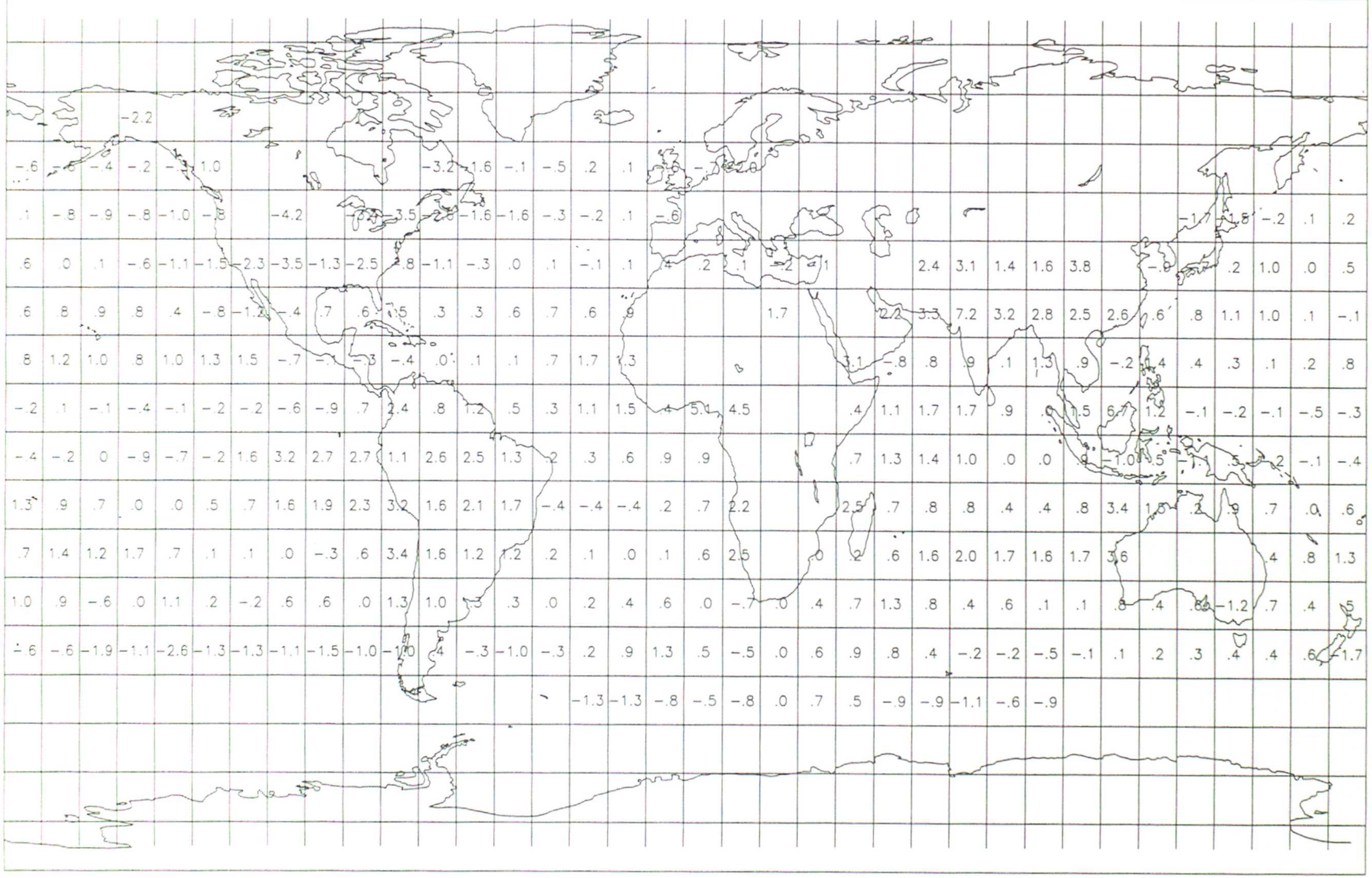

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA
JANUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

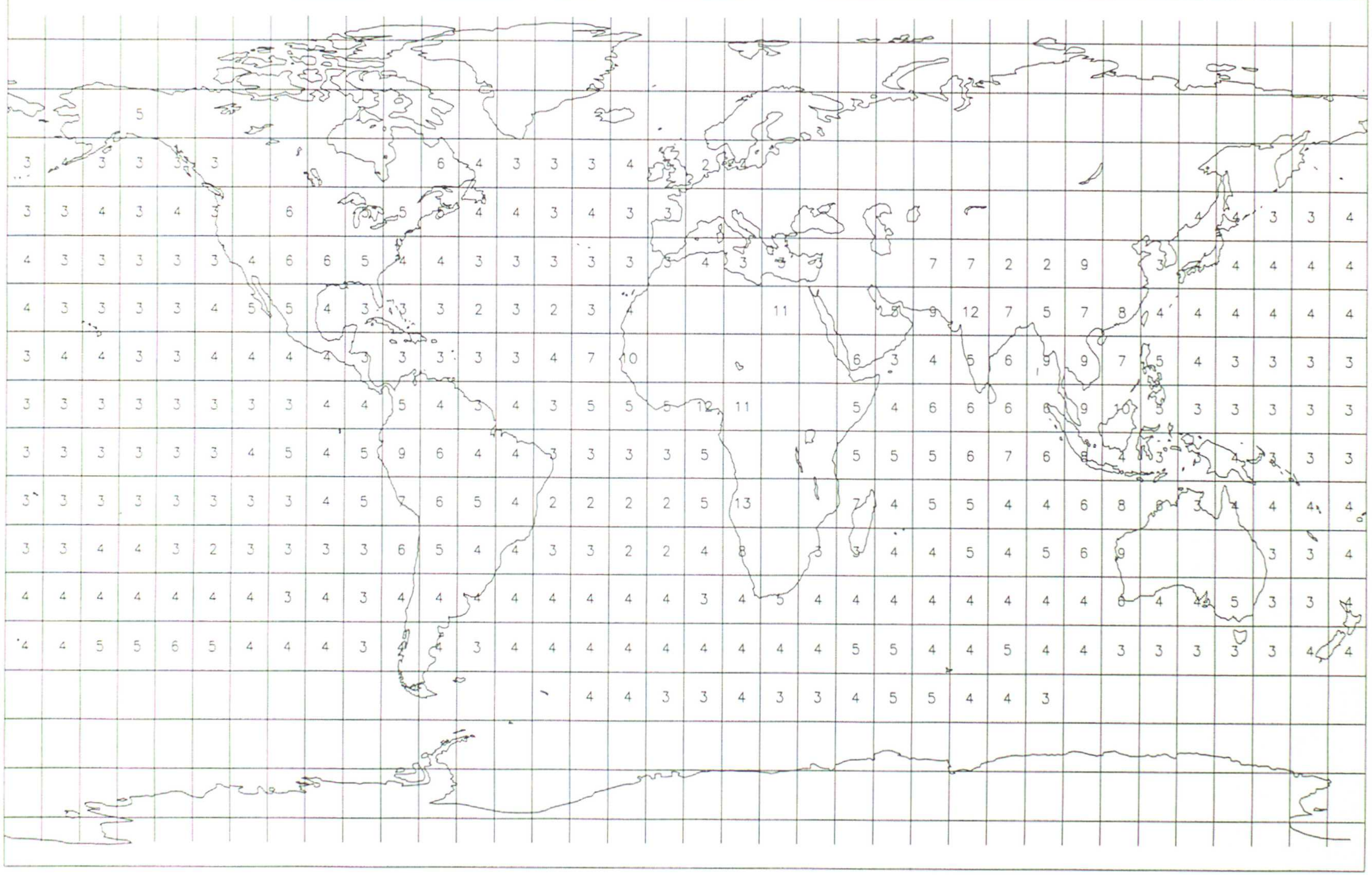
FIGURE 12



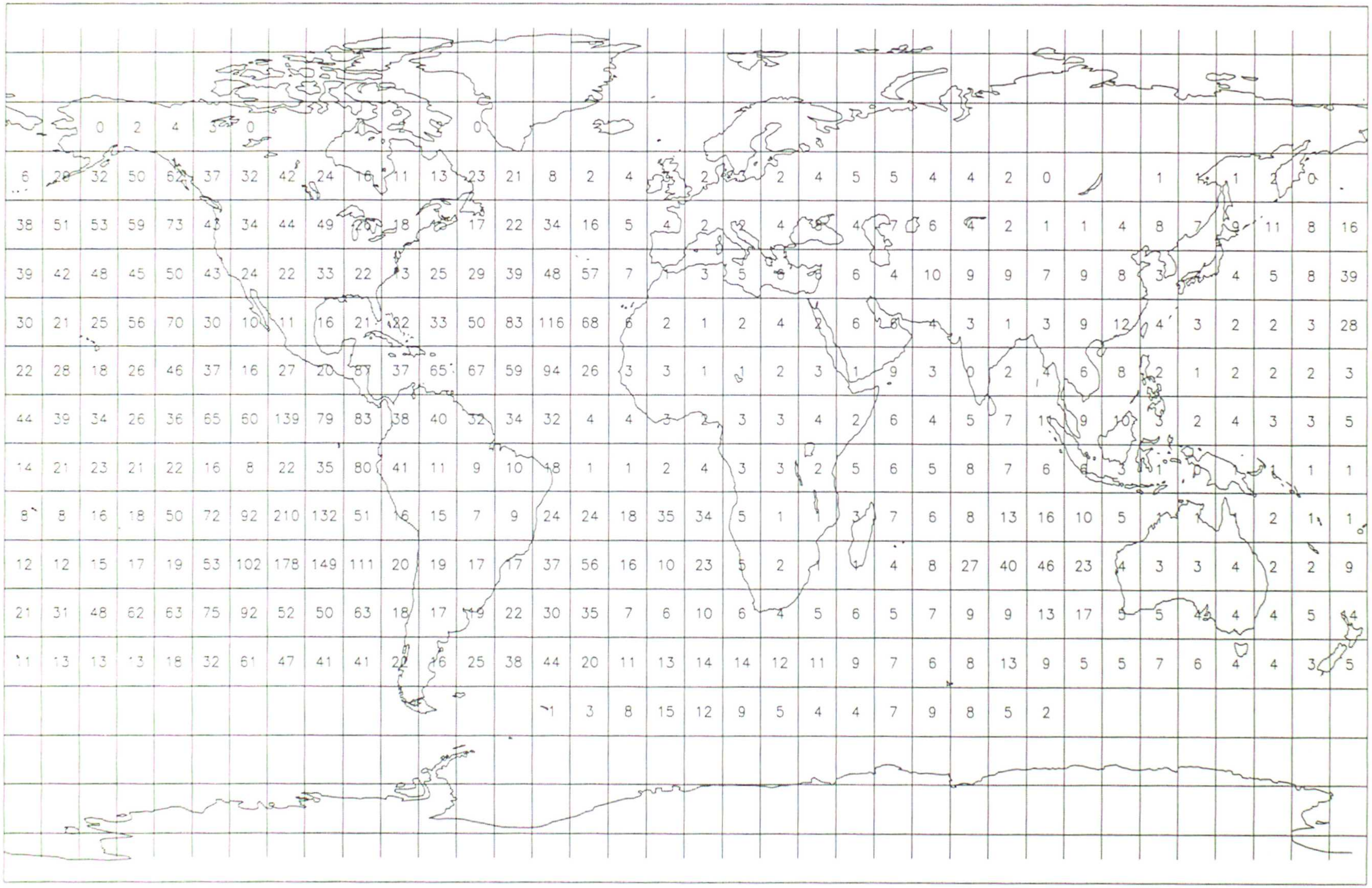
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-2.2
-.6 -.6 -.4 -.2 -.3 1.0 -3.2 -1.6 -.1 -.5 .2 .1 -.6 -.7 -2.0
.1 -.8 -.9 -.8 -1.0 -.8 -4.2 -3.7 -3.5 -2.6 -1.6 -1.6 -.3 -.2 .1 -.6 -1.7 -1.8 -.2 .1 .2
.6 .0 .1 -.6 -1.1 -1.5 -2.3 -3.5 -1.3 -2.5 .8 -1.1 -.3 .0 .1 -.1 .1 .4 .2 .1 -.2 .1 2.4 3.1 1.4 1.6 3.8 -.9 .7 .2 1.0 .0 .5
.6 .8 .9 .8 .4 -.8 -1.2 -.4 .7 .6 .5 .3 .3 .6 .7 .6 .9 1.7 2.2 3.3 7.2 3.2 2.8 2.5 2.6 .6 .8 1.1 1.0 .1 -.1
.8 1.2 1.0 .8 1.0 1.3 1.5 -.7 -.1 -.3 -.4 .0 .1 .1 .7 1.7 1.3 3.1 -.8 .8 .9 .1 1.3 .9 -.2 1.4 .4 .3 .1 .2 .8
-.2 .1 -.1 -.4 -.1 -.2 -.2 -.6 -.9 .7 2.4 .8 1.2 .5 .3 1.1 1.5 .4 5.1 4.5 .4 1.1 1.7 1.7 .9 .0 1.5 6.7 1.2 -.1 -.2 -.1 -.5 -.3
-.4 -.2 .0 -.9 -.7 -.2 1.6 3.2 2.7 2.7 1.1 2.6 2.5 1.3 .2 .3 .6 .9 .9 .7 1.3 1.4 1.0 .0 .0 .9 -1.0 .5 -1.1 .5 .2 -.1 -.4
1.3 .9 .7 .0 .0 .5 .7 1.6 1.9 2.3 3.2 1.6 2.1 1.7 -.4 -.4 -.4 .2 .7 2.2 2.5 .7 .8 .8 .4 .4 .8 3.4 1.5 .2 .9 .7 .0 .6
.7 1.4 1.2 1.7 .7 .1 .1 .0 -.3 .6 3.4 1.6 1.2 1.2 .2 .1 .0 .1 .6 2.5 .0 .2 .6 1.6 2.0 1.7 1.6 1.7 3.6 .4 .8 1.3
1.0 .9 -.6 .0 1.1 .2 -.2 .6 .6 .0 1.3 1.0 .3 .3 .0 .2 .4 .6 .0 -.7 .0 .4 .7 1.3 .8 .4 .6 .1 .1 .8 .4 .8 -1.2 .7 .4 .5
-.6 -.6 -1.9 -1.1 -2.6 -1.3 -1.3 -1.1 -1.5 -1.0 -1.0 .4 -.3 -1.0 -.3 .2 .9 1.3 .5 -.5 .0 .6 .9 .8 .4 -.2 -.2 -.5 -.1 .1 .2 .3 .4 .4 .6 -1.7
-1.3 -1.3 -.8 -.5 -.8 .0 .7 .5 -.9 -.9 -1.1 -.6 -.9

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JANUARY 1999


0 2 4 3 0 0
6 20 32 50 62 37 32 42 24 16 11 13 23 21 8 2 4 2 2 4 5 5 4 4 2 0 1 1 1 2 0
38 51 53 59 73 43 34 44 49 26 18 17 22 34 16 5 4 2 2 4 6 4 7 6 4 2 1 1 4 8 7 9 11 8 16
39 42 48 45 50 43 24 22 33 22 13 25 29 39 48 57 7 1 3 5 6 6 6 4 10 9 9 7 9 8 3 4 5 8 39
30 21 25 56 70 30 10 11 16 21 22 33 50 83 116 68 6 2 1 2 4 2 6 6 4 3 1 3 9 12 4 3 2 2 3 28
22 28 18 26 46 37 16 27 20 87 37 65 67 59 94 26 3 3 1 1 2 3 1 9 3 0 2 4 6 8 2 1 2 2 2 3
44 39 34 26 36 65 60 139 79 83 38 40 32 34 32 4 4 3 2 3 3 4 2 6 4 5 7 11 9 10 3 2 4 3 3 5
14 21 23 21 22 16 8 22 35 80 41 11 9 10 18 1 1 2 4 3 3 2 5 6 5 8 7 6 6 3 1 1 1
8 8 16 18 50 72 92 210 132 51 16 15 7 9 24 24 18 35 34 5 1 1 3 7 6 8 13 16 10 5 1 2 1 1
12 12 15 17 19 53 102 178 149 111 20 19 17 17 37 56 16 10 23 5 2 1 1 4 8 27 40 46 23 4 3 3 4 2 2 9
21 31 48 62 63 75 92 52 50 63 18 17 19 22 30 35 7 6 10 6 4 5 6 5 7 9 9 13 17 5 5 4 4 4 5 14
11 13 13 13 18 32 61 47 41 41 22 16 25 38 44 20 11 13 14 14 12 11 9 7 6 8 13 9 5 5 7 6 4 4 3 5
1 3 8 15 12 9 5 4 4 7 9 8 5 2

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
JANUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

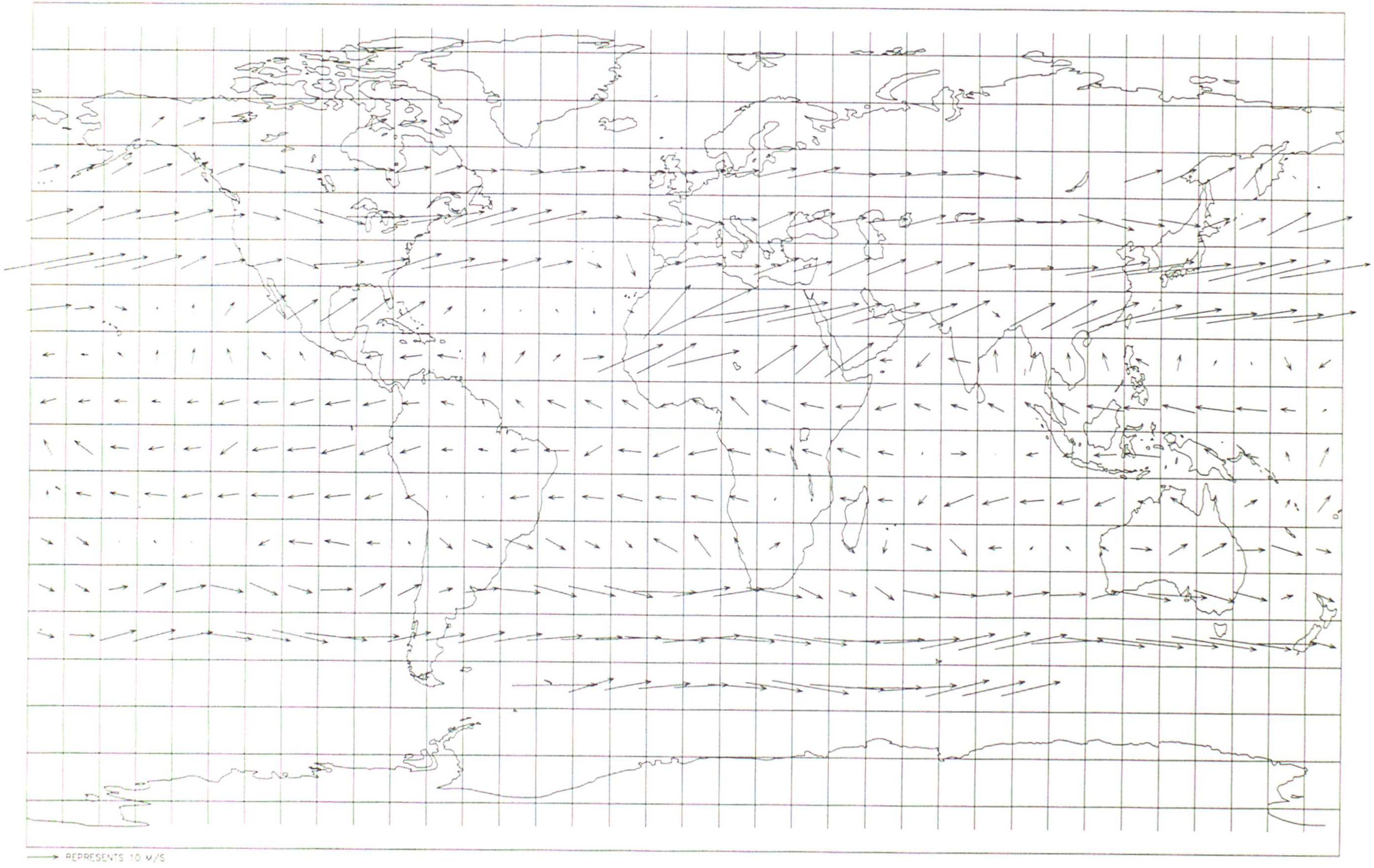
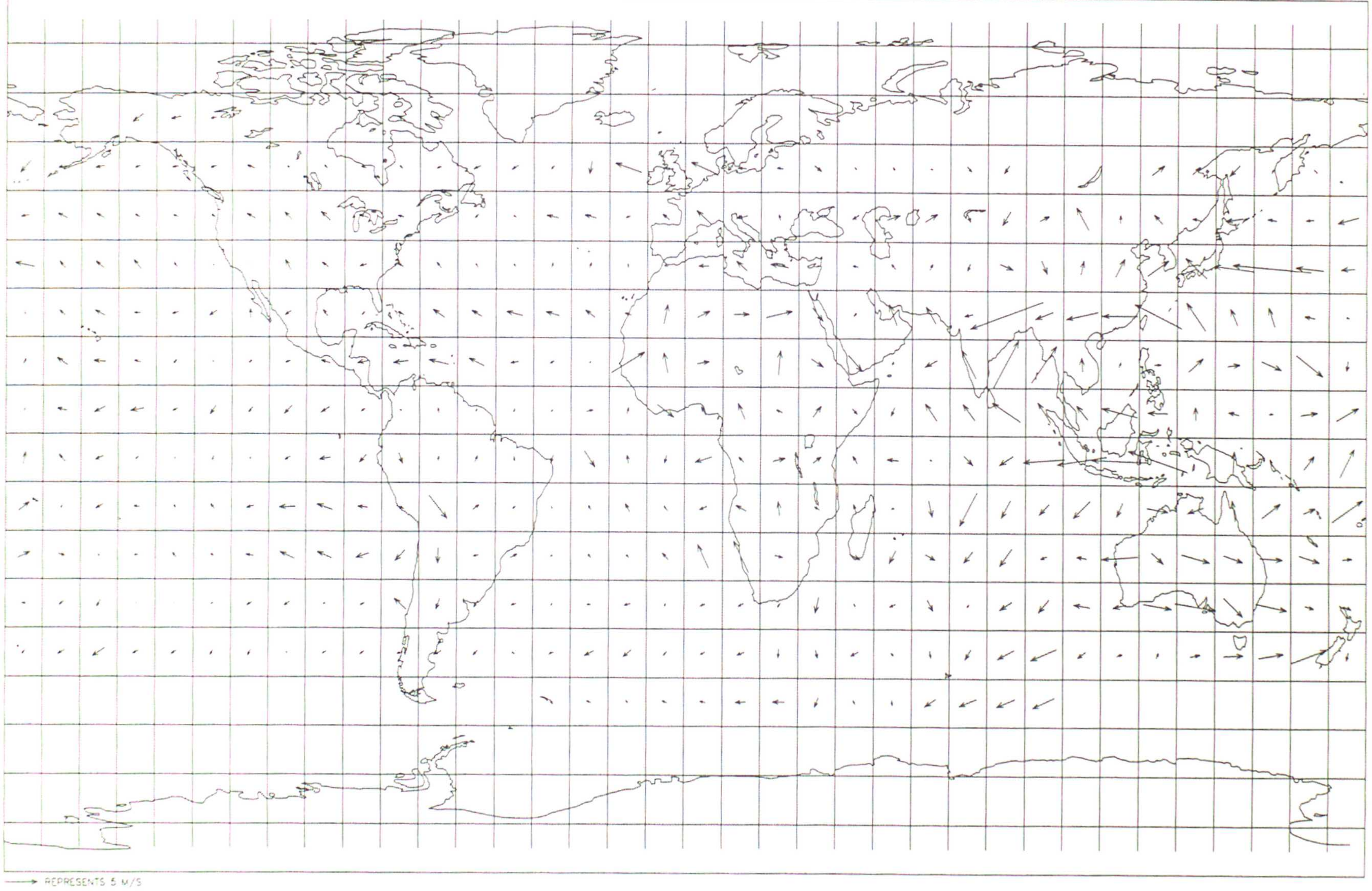
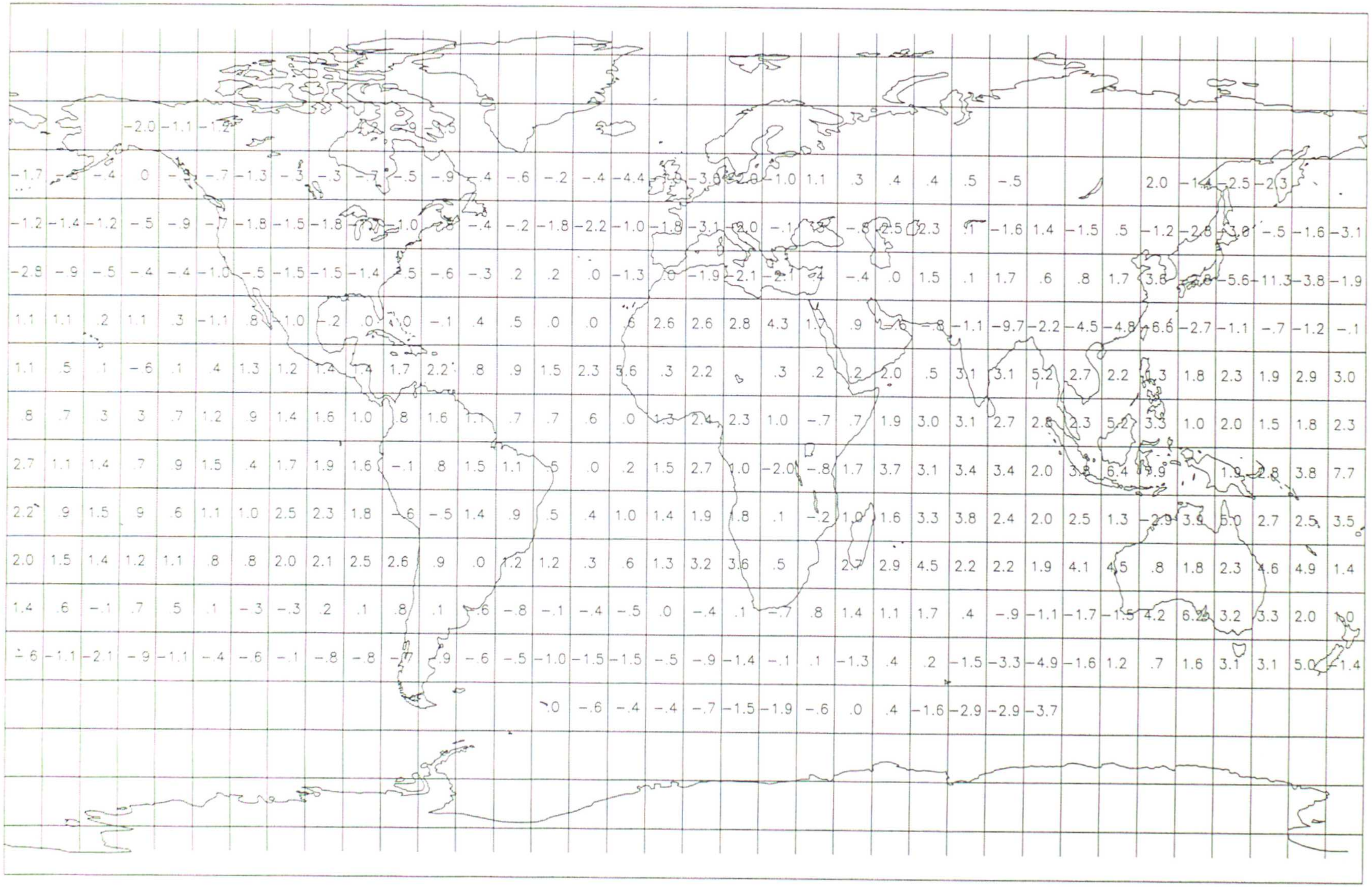

REPRESENTS 10 M/S

FIGURE 17

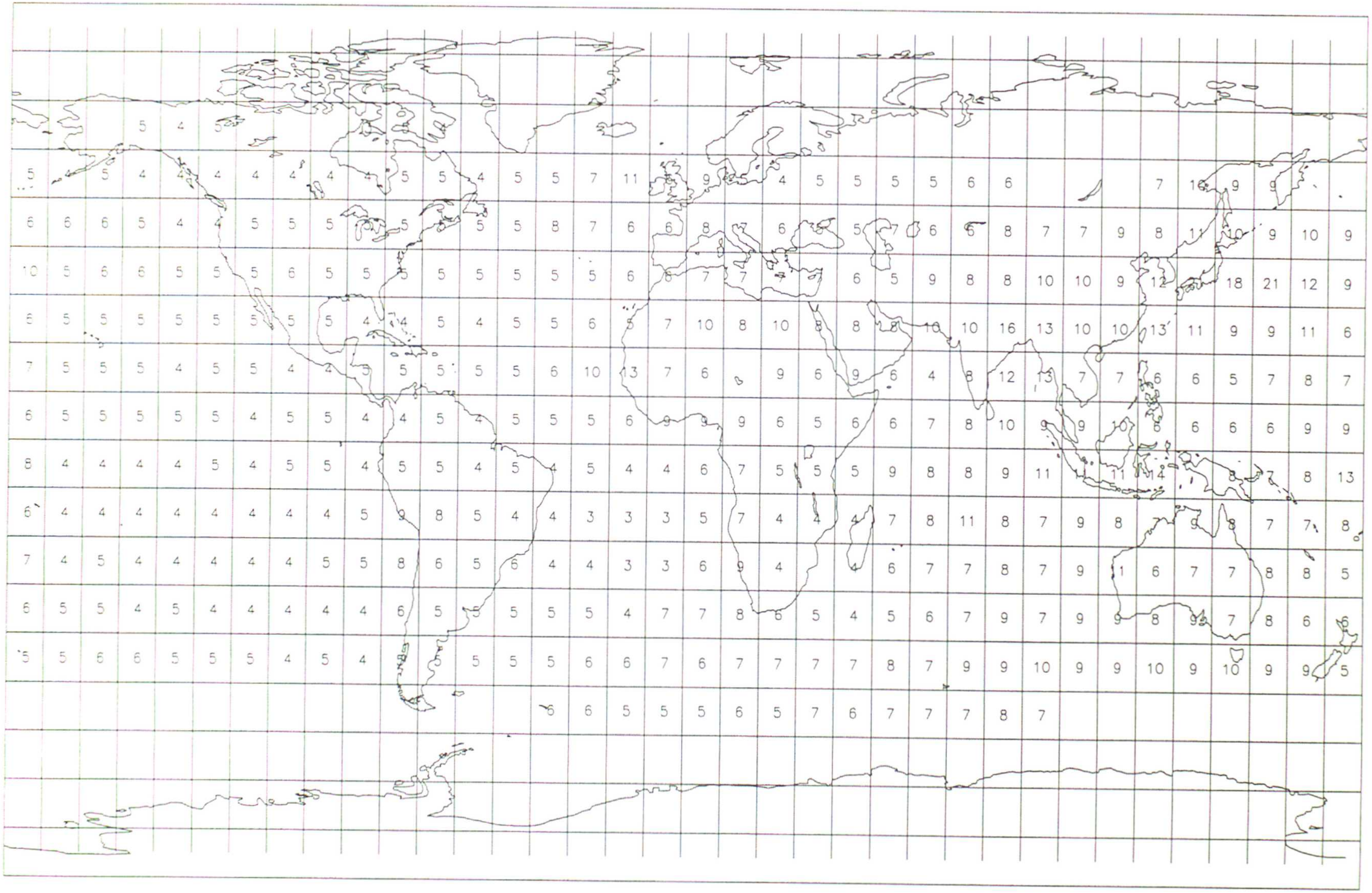
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
JANUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

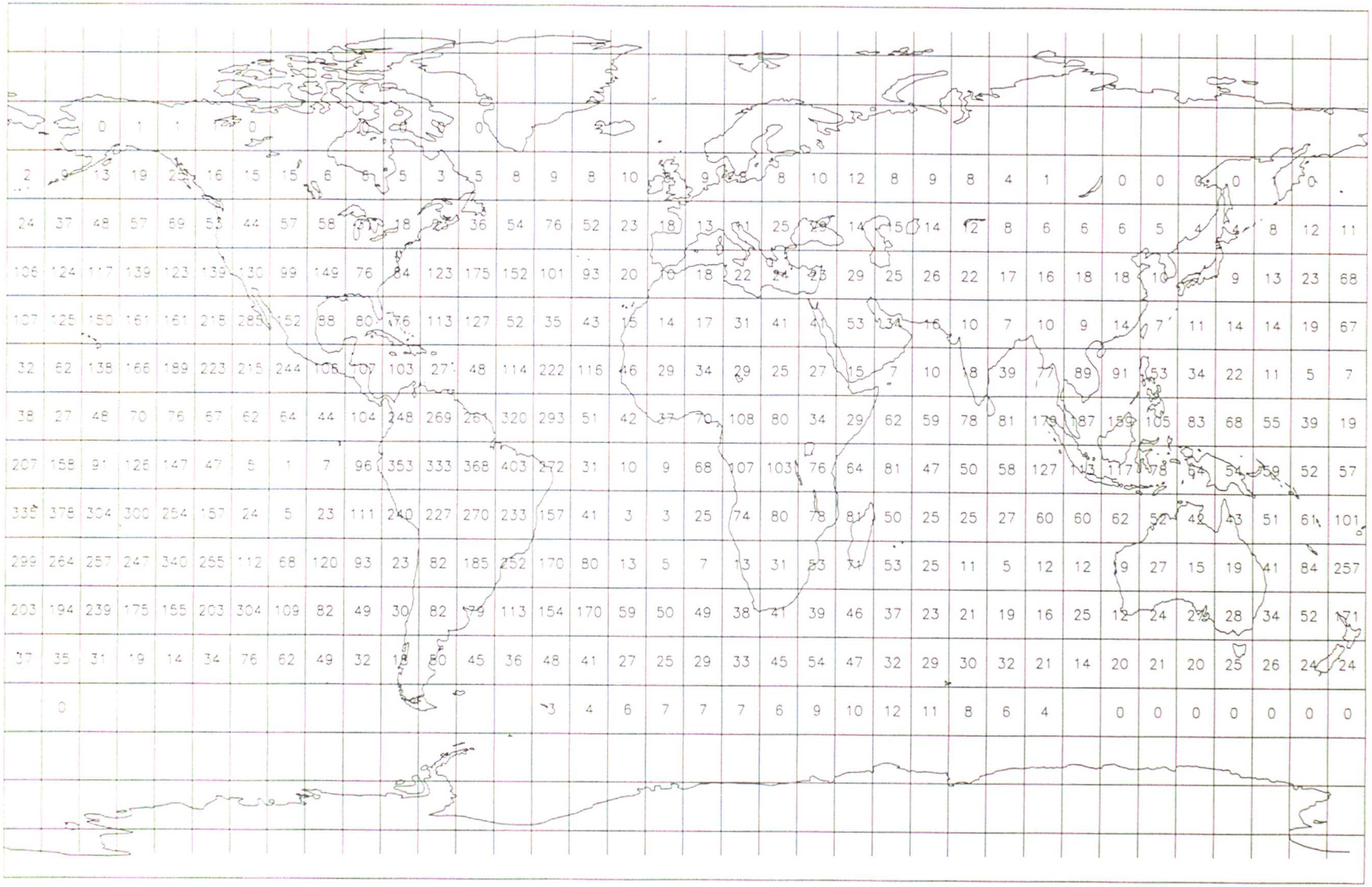

-2.0 -1.1 -1.2
-1.7 -.4 0 -.7 -1.3 -.3 -.3 -.5 -.9 .4 -.6 -.2 -.4 -4.4 -3.0 -1.0 1.1 .3 .4 .4 .5 -.5 2.0 -2.5
-1.2 -1.4 -1.2 -.5 -.9 -.7 -1.8 -1.5 -1.8 -1.0 -.4 -.2 -1.8 -2.2 -1.0 -1.8 -3.1 -.8 2.5 2.3 .1 -1.6 1.4 -1.5 .5 -1.2 -2.8 -.5 -1.6 -3.1
-2.8 -.9 -.5 -.4 -.4 -1.0 -.5 -1.5 -1.5 -1.4 .5 -.6 -.3 .2 .2 .0 -1.3 -1.9 -2.1 -2.1 -.4 .0 1.5 .1 1.7 .6 .8 1.7 3.6 -5.6 -11.3 -3.8 -1.9
1.1 1.1 .2 1.1 .3 -1.1 .8 -1.0 -.2 .0 .0 -.1 .4 .5 .0 .0 2.6 2.6 2.8 4.3 .9 -1.1 -9.7 -2.2 -4.5 -4.8 -6.6 -2.7 -1.1 -.7 -1.2 -.1
1.1 .5 .1 -.6 .1 .4 1.3 1.2 1.7 2.2 .8 .9 1.5 2.3 5.6 .3 2.2 .3 .2 2.0 .5 3.1 3.1 5.2 2.7 2.2 1.8 2.3 1.9 2.9 3.0
.8 .7 .3 .3 .7 1.2 .9 1.4 1.6 1.0 .8 1.6 .7 .7 .6 .0 2.4 2.3 1.0 -.7 .7 1.9 3.0 3.1 2.7 2.3 5.2 3.3 1.0 2.0 1.5 1.8 2.3
2.7 1.1 1.4 .7 .9 1.5 .4 1.7 1.9 1.6 -.1 .8 1.5 1.1 .5 .0 .2 1.5 2.7 1.0 -2.0 -.8 1.7 3.7 3.1 3.4 3.4 2.0 6.4 1.9 3.8 7.7
2.2 .9 1.5 .9 .6 1.1 1.0 2.5 2.3 1.8 -.6 -.5 1.4 .9 .5 .4 1.0 1.4 1.9 .8 .1 -.2 1.0 1.6 3.3 3.8 2.4 2.0 2.5 1.3 -2.9 3.9 5.0 2.7 2.5 3.5
2.0 1.5 1.4 1.2 1.1 .8 .8 2.0 2.1 2.5 2.6 .9 .0 1.2 1.2 .3 .6 1.3 3.2 3.6 .5 2.7 2.9 4.5 2.2 2.2 1.9 4.1 4.5 .8 1.8 2.3 4.6 4.9 1.4
1.4 .6 -.1 .7 .5 .1 -.3 -.3 .2 .1 .8 .1 .6 -.8 -.1 -.4 -.5 .0 -.4 .1 -.7 .8 1.4 1.1 1.7 .4 -.9 -1.1 -1.7 -1.5 4.2 6.2 3.2 3.3 2.0 1.0
-.6 -1.1 -2.1 -.9 -1.1 -.4 -.6 -.1 -.8 -.8 -.7 .9 -.6 -.5 -1.0 -1.5 -1.5 -.5 -.9 -1.4 -.1 .1 -1.3 .4 .2 -1.5 -3.3 -4.9 -1.6 1.2 .7 1.6 3.1 3.1 5.0 -1.4
.0 -.6 -.4 -.4 -.7 -1.5 -1.9 -.6 .0 .4 -1.6 -2.9 -2.9 -3.7

SATOBS : RMS O−B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



			5	4	5																														
5	4	5	4	4	4	4	4	4	4	5	5	4	5	5	7	11		9		4	5	5	5	5	6	6				7	16	9	9		
6	6	6	5	4	4	5	5	5	5	5		5	5	8	7	6	6	8	7	6	5	5	7	6	6	8	7	7	9	8	11	10	9	10	9
10	5	6	6	5	5	5	6	5	5	5	5	5	5	5	5	6	6	7	7	7	7	6	5	9	8	8	10	10	9	12		18	21	12	9
6	5	5	5	5	5	5	5	5	4	4	5	4	5	5	6	5	7	10	8	10	8	8	8	10	10	16	13	10	10	13	11	9	9	11	6
7	5	5	5	4	5	5	4	4	5	5	5	5	5	6	10	13	7	6		9	6	9	6	4	8	12	13	7	7	6	6	5	7	8	7
6	5	5	5	5	5	4	5	5	4	4	5	4	5	5	5	6	9	9	9	6	5	6	6	7	8	10	9	9	10	6	6	6	6	9	9
8	4	4	4	4	5	4	5	5	4	5	5	4	5	4	5	4	4	6	7	5	5	5	9	8	8	9	11	11	11	14		8	7	8	13
6	4	4	4	4	4	4	4	4	5	9	8	5	4	4	3	3	3	5	7	4	4	4	7	8	11	8	7	9	8	7	9	8	7	7	8
7	4	5	4	4	4	4	4	5	5	8	6	5	6	4	4	3	3	6	9	4		4	6	7	7	8	7	9	11	6	7	7	8	8	5
6	5	5	4	5	4	4	4	4	4	6	5	5	5	5	5	4	7	7	8	6	5	4	5	6	7	9	7	9	9	8	9	7	8	6	6
5	5	6	6	5	5	5	4	5	4		5	5	5	5	6	6	7	6	7	7	7	7	8	7	9	9	10	9	9	10	9	10	9	9	5
														6	6	5	5	5	6	5	7	6	7	7	7	8	7								

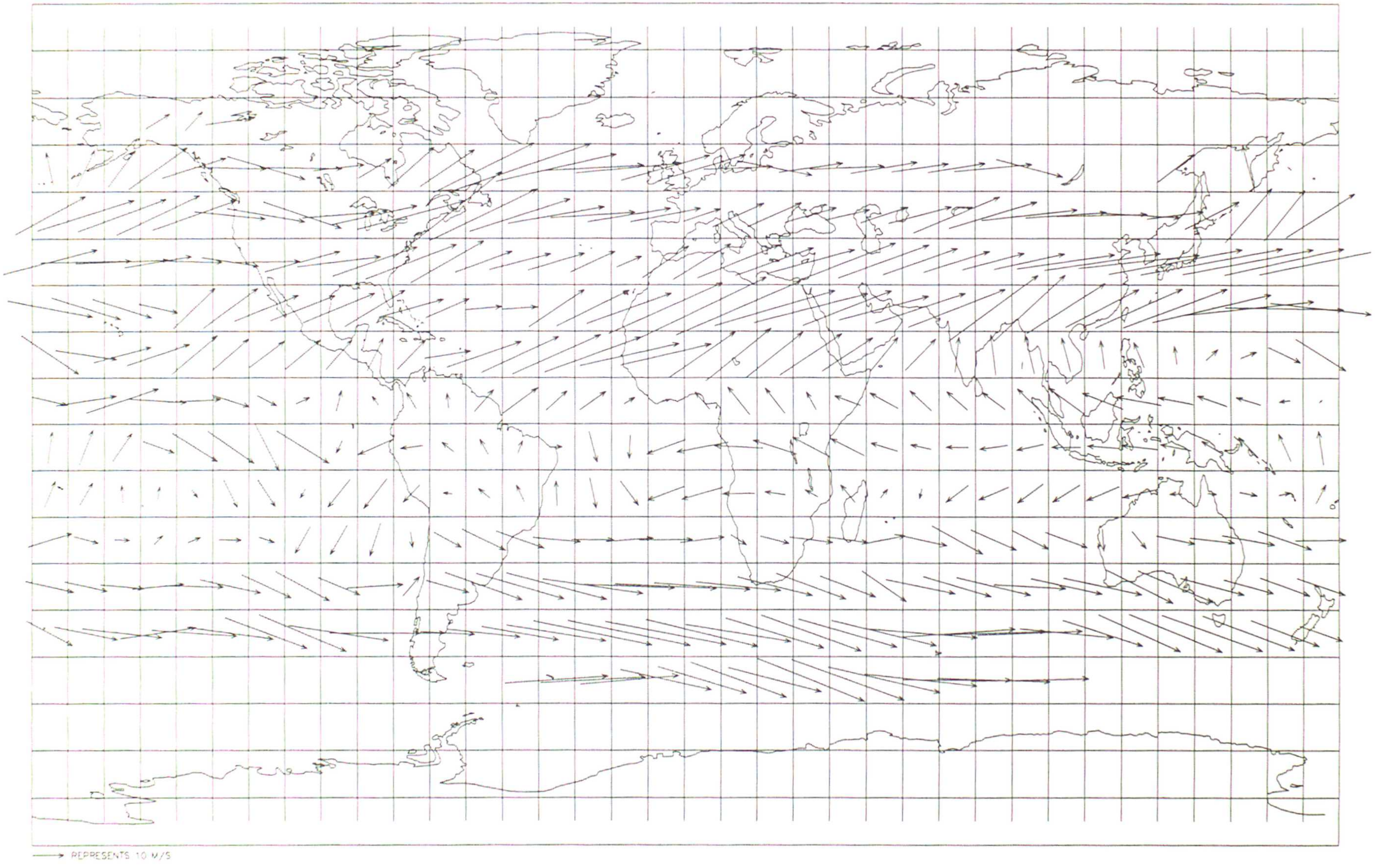
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JANUARY 1999


0 1 1 1 0 0 0 0 0
2 9 13 19 25 16 15 15 6 6 5 3 5 8 9 8 10 8 9 8 8 10 12 8 9 8 4 1 0 0 0 0 0
24 37 48 57 69 53 44 57 58 31 18 23 36 54 76 52 23 18 13 11 25 29 14 15 14 12 8 6 6 6 5 4 4 8 12 11
106 124 117 139 123 139 130 99 149 76 84 123 175 152 101 93 20 10 18 22 24 23 29 25 26 22 17 16 18 18 10 9 13 23 68
107 125 150 161 161 218 285 152 88 80 76 113 127 52 35 43 15 14 17 31 41 41 53 34 16 10 7 10 9 14 7 11 14 14 19 67
32 62 138 166 189 223 215 244 106 107 103 27 48 114 222 116 46 29 34 29 25 27 15 7 10 18 39 77 89 91 53 34 22 11 5 7
38 27 48 70 76 67 62 64 44 104 248 269 261 320 293 51 42 37 70 108 80 34 29 62 59 78 81 179 187 159 105 83 68 55 39 19
207 158 91 126 147 47 5 1 7 96 353 333 368 403 272 31 10 9 68 107 103 76 64 81 47 50 58 127 113 117 78 64 54 59 52 57
335 378 304 300 254 157 24 5 23 111 240 227 270 233 157 41 3 3 25 74 80 78 81 50 25 25 27 60 60 62 52 42 43 51 61 101
299 264 257 247 340 255 112 68 120 93 23 82 185 252 170 80 13 5 7 13 31 53 71 53 25 11 5 12 12 19 27 15 19 41 84 257
203 194 239 175 155 203 304 109 82 49 30 82 79 113 154 170 59 50 49 38 41 39 46 37 23 21 19 16 25 12 24 27 28 34 52 171
37 35 31 19 14 34 76 62 49 32 18 80 45 36 48 41 27 25 29 33 45 54 47 32 29 30 32 21 14 20 21 20 25 26 24 24
0 3 4 6 7 7 7 6 9 10 12 11 8 6 4 0 0 0 0 0 0 0

SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101-400 HPA

FIGURE 21

JANUARY 1999
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


→ REPRESENTS 10 M/S

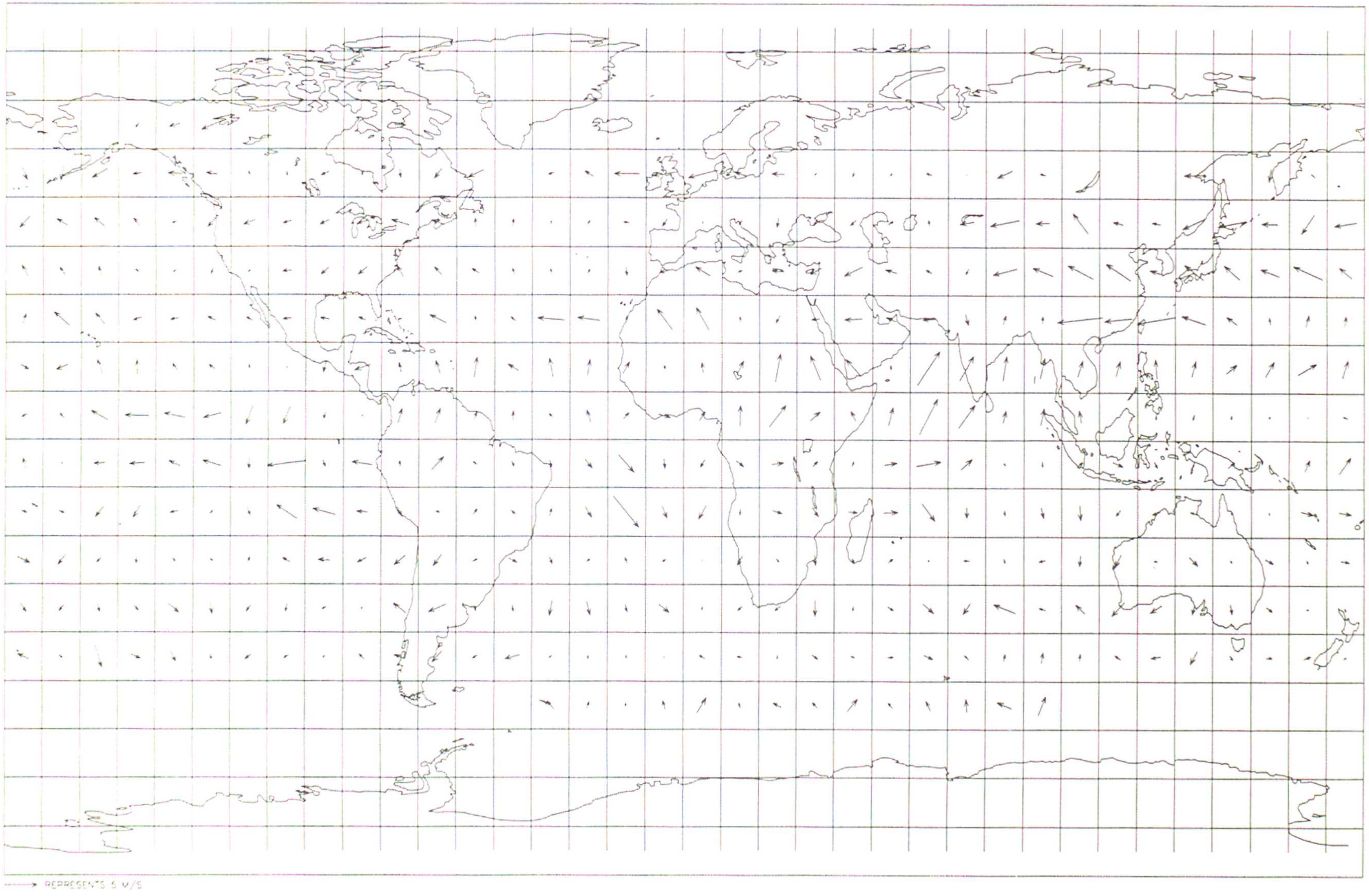
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

JANUARY 1999

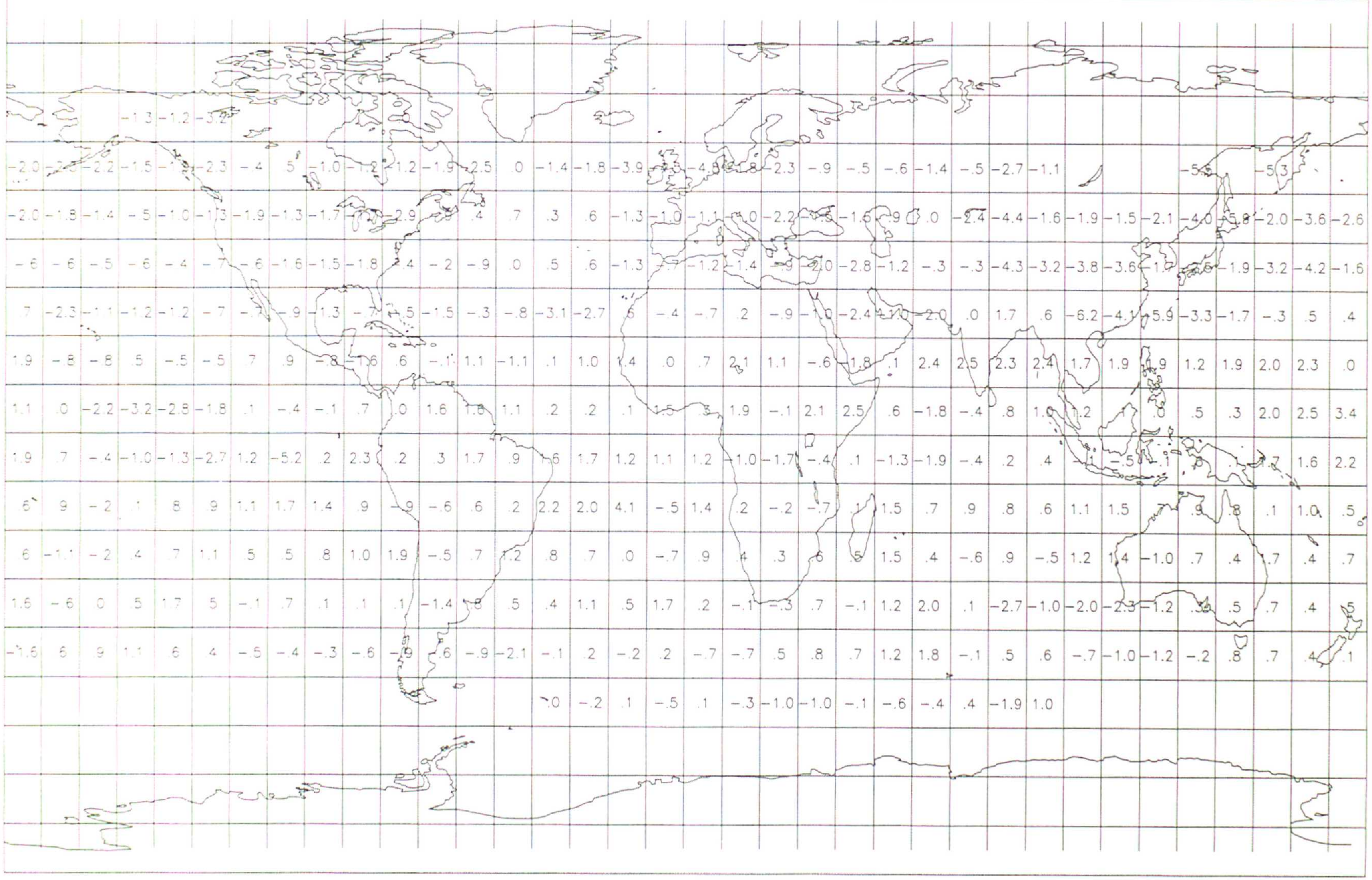
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

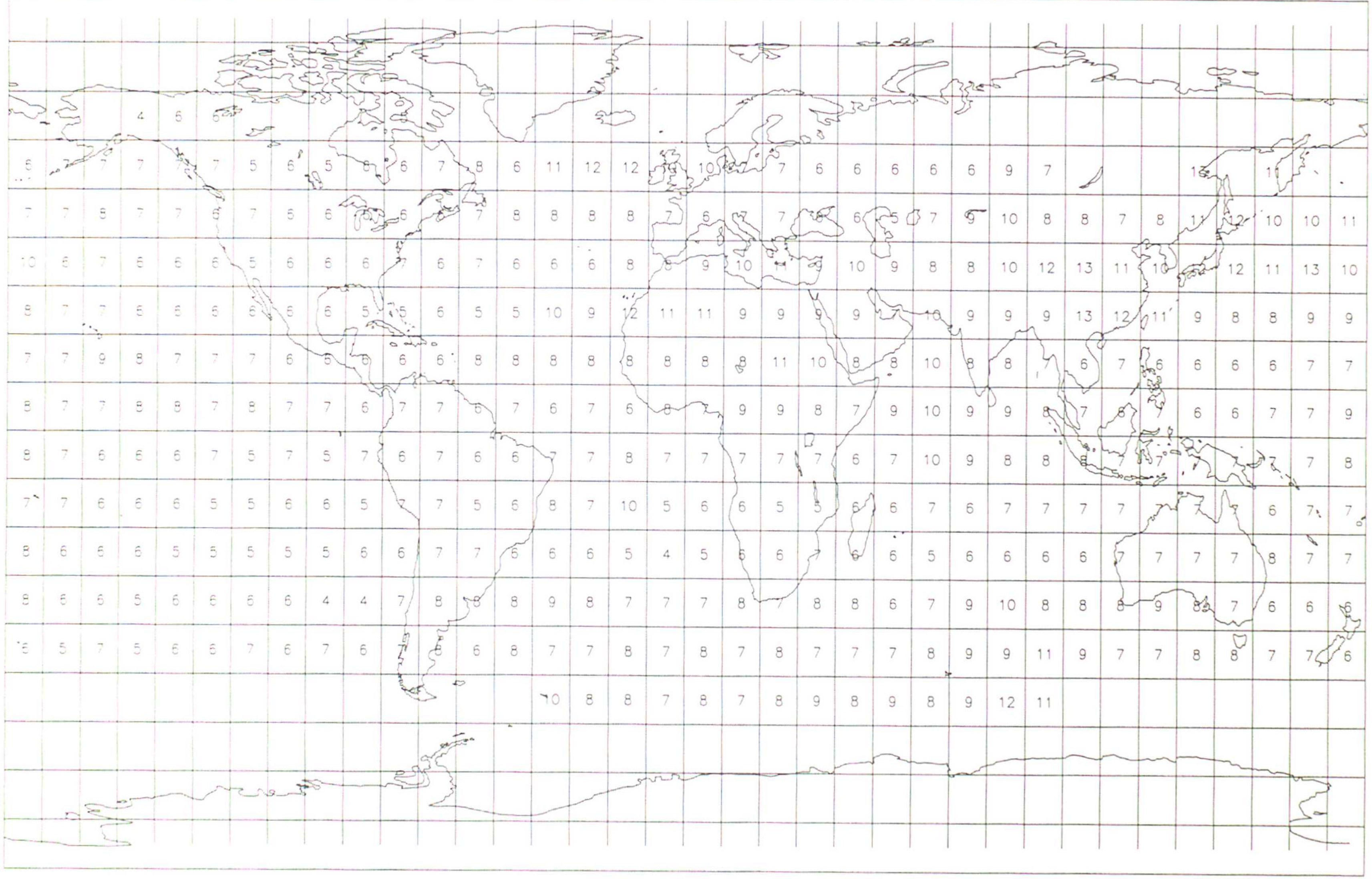
FIGURE 22



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.3 -1.2 -3.2
-2.0 -2.2 -1.5 -2.3 -.4 .5 -1.0 -1.2 -1.2 -1.9 2.5 .0 -1.4 -1.8 -3.9 -4.8 -2.3 -.9 -.5 -.6 -1.4 -.5 -2.7 -1.1 -5.5 -5.3
-2.0 -1.8 -1.4 -.5 -1.0 -1.3 -1.9 -1.3 -1.7 -2.9 .4 .7 .3 .6 -1.3 -1.0 -1.1 -1.0 -2.2 -1.6 .9 .0 -2.4 -4.4 -1.6 -1.9 -1.5 -2.1 -4.0 -5.8 -2.0 -3.6 -2.6
-.6 -.6 -.5 -.6 -.4 -.7 -.6 -1.6 -1.5 -1.8 .4 -.2 -.9 .0 .5 .6 -1.3 -1.2 -1.4 -.9 -2.0 -2.8 -1.2 -.3 -.3 -4.3 -3.2 -3.8 -3.6 -1.7 -1.9 -3.2 -4.2 -1.6
.7 -2.3 -1.1 -1.2 -1.2 -.7 -.7 -.9 -1.3 -.7 -1.5 -1.5 -.3 -.8 -3.1 -2.7 .6 -.4 -.7 .2 -.9 -1.0 -2.4 -1.1 -2.0 .0 1.7 .6 -6.2 -4.1 -5.9 -3.3 -1.7 -.3 .5 .4
1.9 -.8 -.8 .5 -.5 -.5 .7 .9 -.8 -1.6 .6 -.1 1.1 -1.1 .1 1.0 1.4 .0 .7 2.1 1.1 -.6 -1.8 .1 2.4 2.5 2.3 2.4 1.7 1.9 1.9 1.2 1.9 2.0 2.3 .0
1.1 .0 -2.2 -3.2 -2.8 -1.8 .1 -.4 -.1 .7 .0 1.6 1.8 1.1 .2 .2 .1 1.5 .3 1.9 -.1 2.1 2.5 .6 -1.8 -.4 .8 1.0 .2 .1 .0 .5 .3 2.0 2.5 3.4
1.9 .7 -.4 -1.0 -1.3 -2.7 1.2 -5.2 .2 2.3 .2 .3 1.7 .9 1.6 1.7 1.2 1.1 1.2 -1.0 -1.7 -.4 .1 -1.3 -1.9 -.4 .2 .4 -.5 .1 .7 1.6 2.2
.6 .9 -.2 .1 .8 .9 1.1 1.7 1.4 .9 -.9 -.6 .6 .2 2.2 2.0 4.1 -.5 1.4 .2 -.2 -.7 .1 1.5 .7 .9 .8 .6 1.1 1.5 .7 .9 .8 .1 1.0 .5
.6 -1.1 -.2 .4 .7 1.1 .5 .5 .8 1.0 1.9 -.5 .7 1.2 .8 .7 .0 -.7 .9 .4 .3 .6 .5 1.5 .4 -.6 .9 -.5 1.2 1.4 -1.0 .7 .4 .7 .4 .7
1.6 -.6 .0 .5 1.7 .5 -.1 .7 .1 .1 .1 -1.4 .8 .5 .4 1.1 .5 1.7 .2 -.1 -.3 .7 -.1 1.2 2.0 .1 -2.7 -1.0 -2.0 -2.3 -1.2 .3 .5 .7 .4 .5
-1.6 .6 .9 1.1 .6 .4 -.5 -.4 -.3 -.6 -.9 -.6 -.9 -2.1 -.1 .2 -.2 .2 -.7 -.7 .5 .8 .7 1.2 1.8 -.1 .5 .6 -.7 -1.0 -1.2 -.2 .8 .7 .4 .1
.0 -.2 .1 -.5 .1 -.3 -1.0 -1.0 -.1 -.6 -.4 .4 -1.9 1.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JANUARY 1999
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 6 6
6 7 7 7 7 7 5 6 5 8 6 7 8 6 11 12 12 10 10 7 7 6 6 6 6 6 9 7 13 11
7 7 8 7 7 6 7 6 6 5 6 7 8 8 8 8 7 6 7 7 6 6 5 7 9 10 8 8 7 8 11 12 10 10 11
10 6 7 6 6 6 5 6 6 6 7 6 7 6 6 6 8 8 9 10 11 9 10 9 8 8 10 12 13 11 10 12 11 13 10
8 7 7 6 6 6 6 6 6 5 5 6 5 5 10 9 12 11 11 9 9 9 9 7 10 9 9 9 13 12 11 9 8 8 9 9
7 7 9 8 7 7 7 6 5 6 6 6 8 8 8 8 8 8 8 8 11 10 8 8 10 8 8 7 6 7 6 6 6 6 7 7
8 7 7 8 8 7 8 7 7 6 7 7 6 7 6 7 6 8 7 9 9 8 7 9 10 9 9 8 7 8 7 6 6 7 7 9
8 7 6 6 6 7 5 7 5 7 6 7 6 6 7 7 8 7 7 7 7 7 6 7 10 9 8 8 8 7 7 7 7 8
7 7 6 6 6 5 5 6 6 5 7 7 5 6 8 7 10 5 6 6 5 5 6 6 7 6 7 7 7 7 7 7 7 6 7 7
8 6 6 6 5 5 5 5 5 6 6 7 7 6 6 6 5 4 5 6 6 7 6 6 5 6 6 6 6 7 7 7 7 8 7 7
8 6 6 5 6 6 6 6 4 4 7 8 8 8 9 8 7 7 7 8 7 8 8 6 7 9 10 8 8 8 9 8 7 6 6 6
6 5 7 5 6 6 7 6 7 6 7 8 6 8 7 7 8 7 8 7 8 7 7 7 8 9 9 11 9 7 7 8 8 7 7 6
10 8 8 7 8 7 8 9 8 9 8 9 12 11

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: January 1999

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-14 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa
	:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13503	19.7	-68.9	ALL	P	SUR	182	0	0	0.9	-0.3	0.9
13504	23.3	-23.8	ALL	P	SUR	177	0	0	0.9	-0.4	1.0
13505	16.0	-25.7	ALL	P	SUR	659	3	0	0.8	-0.2	0.8
13507	22.9	-29.8	ALL	P	SUR	712	0	0	0.8	-0.2	0.8
13508	16.9	-32.0	ALL	P	SUR	678	0	0	0.8	0.0	0.8
13509	13.5	-27.5	ALL	P	SUR	635	0	0	0.8	-0.6	1.0
41502	21.3	-45.0	ALL	P	SUR	221	0	0	0.9	0.2	0.9
41503	24.8	-59.7	ALL	P	SUR	255	0	0	0.9	0.0	0.9
41504	26.1	-66.1	ALL	P	SUR	280	0	0	0.9	0.1	0.9
41505	31.8	-64.1	ALL	P	SUR	301	0	0	0.9	0.2	0.9
41521	28.0	-60.9	ALL	P	SUR	293	0	0	0.9	-0.1	0.9
41528	26.5	-70.4	ALL	P	SUR	278	0	0	0.9	0.2	0.9
41597	28.2	-29.2	ALL	P	SUR	397	0	0	0.8	-0.1	0.8
41598	26.6	-44.7	ALL	P	SUR	1193	14	1	1.4	0.5	1.5
41599	25.5	-38.3	ALL	P	SUR	414	6	1	1.0	-0.5	1.1
41625	26.9	-73.2	ALL	P	SUR	276	0	0	1.0	0.0	1.0
41629	27.6	-67.5	ALL	P	SUR	276	0	0	0.9	0.1	0.9
41633	15.8	-60.4	ALL	P	SUR	223	7	3	5.2	-3.6	6.3
41636	19.5	-58.1	ALL	P	SUR	486	23	5	1.1	0.1	1.1
41637	24.9	-48.9	ALL	P	SUR	239	12	5	1.0	0.4	1.1
41638	22.2	-62.3	ALL	P	SUR	554	7	1	1.2	0.3	1.3
44601	51.4	-33.5	ALL	P	SUR	787	90	11	2.9	1.8	3.5
44602	56.8	-27.2	ALL	P	SUR	168	8	5	2.1	0.8	2.3
44604	45.5	-24.5	ALL	P	SUR	528	0	0	3.0	2.3	3.8
44607	52.7	-44.6	ALL	P	SUR	188	0	0	2.6	0.4	2.6
44608	49.8	-48.1	ALL	P	SUR	228	0	0	1.6	-0.5	1.7
44613	44.2	-22.5	ALL	P	SUR	843	16	2	1.4	-0.3	1.4
44616	58.0	-35.6	ALL	P	SUR	68	0	0	2.4	-0.4	2.4
44726	60.8	-16.5	ALL	P	SUR	1687	11	1	2.0	0.1	2.0
44742	46.3	-9.0	ALL	P	SUR	883	11	1	1.6	-0.3	1.7
44760	53.1	-20.2	ALL	P	SUR	1189	7	1	2.2	-0.2	2.2
44762	41.6	-40.6	ALL	P	SUR	469	1	0	1.5	0.4	1.5
44764	51.1	-27.4	ALL	P	SUR	603	20	3	2.5	-1.4	2.9
44772	54.1	-15.7	ALL	P	SUR	1407	53	4	3.1	-1.0	3.3
44773	57.1	-7.4	ALL	P	SUR	2	0	0	0.5	1.3	1.4
44774	55.2	-8.8	ALL	P	SUR	661	4	1	2.4	-0.3	2.4
44775	59.0	-21.6	ALL	P	SUR	1	0	0	0.0	-11.9	11.9
44778	48.4	-32.4	ALL	P	SUR	962	11	1	1.8	-0.9	2.0
44901	54.2	-20.9	ALL	P	SUR	164	0	0	2.3	0.6	2.4
44925	53.8	-25.4	ALL	P	SUR	39	16	41	8.4	-3.8	9.2
47556	69.6	-66.2	ALL	P	SUR	115	0	0	1.3	0.2	1.3
61521	35.4	-3.0	ALL	P	SUR	15	0	0	1.0	-1.6	1.9
62511	45.8	-16.7	ALL	P	SUR	712	18	3	1.4	0.6	1.5
62512	46.6	-18.1	ALL	P	SUR	243	0	0	1.3	0.3	1.3
62513	47.9	-12.2	ALL	P	SUR	749	5	1	1.4	0.5	1.5
62515	62.0	-17.7	ALL	P	SUR	2186	6	0	2.7	0.8	2.8
62517	47.8	-11.9	ALL	P	SUR	281	2	1	1.9	2.4	3.1
62518	43.9	-13.6	ALL	P	SUR	71	71	100	0.0	0.0	0.0
62519	39.1	-19.7	ALL	P	SUR	1034	4	0	1.6	0.3	1.6
62520	42.8	-18.8	ALL	P	SUR	969	4	0	1.1	-0.3	1.2
62554	45.2	-15.5	ALL	P	SUR	1033	2	0	1.3	0.2	1.3
62674	63.4	-20.3	ALL	P	SUR	305	0	0	2.1	-0.4	2.1
64529	60.5	-25.5	ALL	P	SUR	1198	11	1	2.2	-0.7	2.3
64563	63.0	-8.5	ALL	P	SUR	6	5	83	0.0	12.0	12.0
65571	63.4	-27.8	ALL	P	SUR	348	84	24	3.9	-2.8	4.8
65581	59.1	-18.8	ALL	P	SUR	516	1	0	2.2	-0.4	2.2
65591	55.2	-26.0	ALL	P	SUR	824	7	1	2.0	-0.8	2.1
65592	59.6	-32.7	ALL	P	SUR	927	4	0	2.1	-0.6	2.2
65597	55.0	-8.4	ALL	P	SUR	30	0	0	1.7	-0.4	1.8
65599	61.9	-36.2	ALL	P	SUR	1581	17	1	1.8	-0.1	1.8

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
039129	30.1	-15.0	ALL	SPEED	SUR	2	0	0	0.0	-2.7	2.7
13503	19.7	-68.9	ALL	SPEED	SUR	138	0	0	2.0	-2.0	2.8
41504	26.1	-66.1	ALL	SPEED	SUR	418	0	0	2.1	0.1	2.1
41521	28.0	-60.9	ALL	SPEED	SUR	366	0	0	1.6	-0.4	1.7
41522	14.7	-79.4	ALL	SPEED	SUR	118	36	31	6.9	9.8	11.9
41528	26.5	-70.4	ALL	SPEED	SUR	2	0	0	0.0	-6.7	6.7
41599	25.5	-38.3	ALL	SPEED	SUR	130	55	42	6.1	15.9	17.0
41625	26.9	-73.2	ALL	SPEED	SUR	352	0	0	2.0	0.2	2.0
41629	27.6	-67.5	ALL	SPEED	SUR	367	0	0	1.8	0.0	1.8
41633	15.8	-60.4	ALL	SPEED	SUR	50	0	0	2.6	-6.8	7.3
41636	19.5	-58.1	ALL	SPEED	SUR	326	0	0	1.5	-0.8	1.7
41637	24.9	-48.9	ALL	SPEED	SUR	178	1	1	1.6	0.7	1.8
41638	22.2	-62.3	ALL	SPEED	SUR	427	1	0	1.9	-0.9	2.1
44601	51.4	-33.5	ALL	SPEED	SUR	487	8	2	3.0	-0.1	3.0
44602	56.8	-27.2	ALL	SPEED	SUR	106	1	1	3.7	1.0	3.8
44607	52.7	-44.6	ALL	SPEED	SUR	200	0	0	3.7	1.0	3.8
44613	44.2	-22.5	ALL	SPEED	SUR	1	0	0	0.0	28.3	28.3
44742	46.3	-9.0	ALL	SPEED	SUR	1	0	0	0.0	-0.3	0.3
44762	41.6	-40.6	ALL	SPEED	SUR	494	2	0	3.4	1.7	3.8
44774	55.2	-8.8	ALL	SPEED	SUR	1	0	0	0.0	24.2	24.2
62511	45.8	-16.7	ALL	SPEED	SUR	1	0	0	0.0	-10.8	10.8
62513	47.9	-12.2	ALL	SPEED	SUR	1	0	0	0.0	-5.7	5.7
62515	62.0	-17.7	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
62517	47.8	-11.9	ALL	SPEED	SUR	873	0	0	2.1	-0.5	2.2
62518	43.9	-13.6	ALL	SPEED	SUR	1	0	0	0.0	-6.2	6.2
62519	39.1	-19.7	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
62634	60.4	-4.0	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
65581	59.1	-18.8	ALL	SPEED	SUR	1	0	0	0.0	31.5	31.5
65599	61.9	-36.2	ALL	SPEED	SUR	1071	7	1	3.7	-1.3	3.9
WIND DIRECTION											
13503	19.7	-68.9	ALL	DIRN.	SUR	78	0	0	19.3	-7.2	20.6
41502	21.3	-45.0	ALL	DIRN.	SUR	213	0	0	16.5	11.3	20.0
41503	24.8	-59.7	ALL	DIRN.	SUR	253	0	0	24.9	17.2	30.3
41504	26.1	-66.1	ALL	DIRN.	SUR	129	0	0	23.7	13.4	27.2
41521	28.0	-60.9	ALL	DIRN.	SUR	213	0	0	18.0	-12.6	22.0
41522	14.7	-79.4	ALL	DIRN.	SUR	119	36	30	21.9	-5.9	22.6
41598	26.6	-44.7	ALL	DIRN.	SUR	210	0	0	18.2	-2.7	18.4
41599	25.5	-38.3	ALL	DIRN.	SUR	165	55	33	15.0	2.4	15.2
41625	26.9	-73.2	ALL	DIRN.	SUR	178	0	0	26.1	11.7	28.6
41629	27.6	-67.5	ALL	DIRN.	SUR	179	0	0	21.0	6.5	22.0
41633	15.8	-60.4	ALL	DIRN.	SUR	81	0	0	12.6	2.3	12.8
41636	19.5	-58.1	ALL	DIRN.	SUR	347	0	0	15.6	13.7	20.8
41637	24.9	-48.9	ALL	DIRN.	SUR	167	1	1	15.5	-10.1	18.5
41638	22.2	-62.3	ALL	DIRN.	SUR	285	1	0	14.6	16.2	21.8
44601	51.4	-33.5	ALL	DIRN.	SUR	463	8	2	42.4	-28.4	51.0
44602	56.8	-27.2	ALL	DIRN.	SUR	82	1	1	29.8	78.1	83.6
44607	52.7	-44.6	ALL	DIRN.	SUR	153	0	0	25.6	-5.9	26.3
44742	46.3	-9.0	ALL	DIRN.	SUR	1	0	0	0.0	95.1	95.1
44762	41.6	-40.6	ALL	DIRN.	SUR	400	2	0	32.8	-9.1	34.0
62513	47.9	-12.2	ALL	DIRN.	SUR	1	0	0	0.0	97.0	97.0
62515	62.0	-17.7	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
62517	47.8	-11.9	ALL	DIRN.	SUR	591	0	0	19.6	3.9	20.0
62634	60.4	-4.0	ALL	DIRN.	SUR	1	0	0	0.0	-13.9	13.9
65599	61.9	-36.2	ALL	DIRN.	SUR	752	7	1	26.5	7.0	27.4

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in $m\ s^{-1}$
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 $m\ s^{-1}$ Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2693	1	19	1.9	-0.1	2314	0	11	0	8.7	0.7
ACA	1151	0	9	2.0	0.0	1085	0	5	0	7.1	0.4
AEA	210	0	28	2.6	0.7	201	0	27	0	12.0	-0.8
AEL	718	1	23	1.9	-0.5	726	1	23	0	9.9	1.2
AEY	40	0	8	1.4	0.8	43	2	16	0	9.8	2.5
AFL	313	0	5	2.0	0.3	309	1	4	0	7.7	0.8
AFR	1326	1	13	1.7	0.0	1337	0	14	0	9.2	1.3
AIH	133	1	4	1.5	0.1	135	0	4	0	9.6	0.4
AJM	80	0	4	1.5	-0.5	81	1	5	0	9.9	0.4
AMM	61	0	7	1.7	0.0	61	2	7	0	10.4	1.8
AMX	230	1	3	1.9	-0.1	236	1	4	0	10.5	0.8
ANZ	169	0	7	2.0	-1.1	168	1	7	0	6.3	-0.5
AOM	349	0	2	1.7	1.0	357	0	4	0	8.6	1.3
AVA	153	1	1	2.0	-0.2	155	1	7	0	10.1	0.0
AZA	286	1	70	2.7	0.5	272	0	16	0	10.3	0.7
BAF	21	0	0	1.2	-0.2	21	0	0	0	7.1	3.2
BAL	375	0	21	2.0	-0.9	371	1	22	0	8.8	1.2
BAW	1374	1	17	2.1	-0.1	1337	1	15	0	8.8	0.8
BBB	21	0	10	2.3	-0.9	21	0	10	0	15.0	2.9
BLX	39	3	15	1.7	-0.2	41	0	15	0	12.8	3.7
BWA	126	1	16	2.3	1.4	122	0	11	0	10.1	1.9
CDN	574	1	12	1.9	0.5	524	0	8	0	8.4	1.0
CFG	589	1	5	2.0	-0.4	581	0	3	0	9.1	1.0
CKT	100	1	14	2.2	0.9	101	1	12	0	12.3	1.1
CLX	271	0	6	2.1	-0.3	268	0	4	0	7.9	-0.4
CMM	75	0	7	1.8	-0.1	69	0	3	0	5.6	0.5
COA	762	1	16	2.0	-0.1	683	0	12	0	12.9	2.5
CRL	347	2	3	1.8	0.3	348	0	3	0	8.8	1.3
CTB	179	0	2	1.8	-0.5	179	1	2	0	8.8	1.9
CUB	252	0	8	2.0	0.6	257	2	9	0	9.4	0.9
DAL	1239	0	30	2.1	-0.5	1012	0	21	0	9.0	1.3
DBY	353	0	4	1.9	-0.9	358	0	5	0	10.2	1.1
DLH	1854	0	16	1.9	0.0	1747	0	13	0	7.5	0.7
EEZ	42	0	21	1.9	-0.2	41	0	20	0	9.1	-0.4
ELY	126	1	8	2.1	0.0	128	0	7	0	8.9	0.8
EWW	74	0	8	1.8	-0.1	69	1	7	0	9.3	2.0
FDX	517	1	16	2.0	-0.3	461	1	11	0	10.5	0.2
FIN	523	1	17	2.0	0.3	448	1	11	0	6.6	0.4
GRL	27	0	0	1.7	-0.3	27	0	0	0	5.4	0.4
GTI	25	0	16	3.2	-0.2	24	0	17	0	11.0	4.0
HLF	50	0	12	2.0	-0.5	47	2	6	0	7.3	1.4
IBE	1361	1	26	2.1	0.3	1317	1	26	0	10.1	1.3
ICE	903	0	16	1.8	0.3	785	0	9	0	7.1	0.1
JKK	136	1	12	1.8	-0.4	119	0	8	0	11.2	1.2
KLM	1911	0	9	1.8	0.1	1837	0	7	0	7.9	0.8
LDA	136	1	16	2.2	0.4	135	0	16	0	10.0	1.4
LDI	473	1	67	2.1	-1.0	443	1	23	0	11.4	0.9
LIB	113	0	4	1.7	1.0	119	1	7	0	10.8	1.0
LOT	82	0	20	2.3	-0.9	66	0	9	0	5.3	-0.2
LTU	377	0	18	1.9	-0.5	331	0	8	0	9.1	1.7
MAS	65	0	11	2.3	0.5	63	0	13	0	7.2	1.1
MPD	42	2	10	2.4	1.2	43	0	9	0	10.1	-1.3
MPH	408	0	7	1.9	-0.4	407	0	8	0	9.7	0.8
NWA	2797	1	7	2.1	0.7	2715	0	4	0	8.2	0.7
PAC	87	1	22	2.2	0.7	81	1	17	0	9.0	-0.2
RAM	39	5	10	2.6	-0.7	39	0	8	0	11.4	1.9
RCH	103	7	23	2.4	0.4	99	0	13	0	11.8	1.5
RJA	24	0	0	1.8	0.2	25	0	4	0	10.8	0.6
RRR	103	6	22	1.7	0.0	104	1	24	0	12.9	0.4

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SAB	28	0	0	1.8	-0.3	28	0	0	0	10.1	2.8
SAS	1442	0	1	1.8	-0.1	1431	0	2	0	7.5	0.1
SIA	122	0	5	2.2	-0.9	123	1	5	0	8.5	1.4
SLR	111	0	24	2.1	-0.5	112	1	24	0	8.0	1.7
SVA	79	1	8	2.1	0.0	82	2	10	0	10.1	0.1
SWR	94	4	27	2.8	-0.5	79	0	11	0	10.0	1.6
TAP	266	1	12	2.2	-0.4	263	1	13	0	10.6	1.5
TOW	79	0	19	2.1	0.3	69	0	16	0	11.6	0.2
TSC	24	0	13	2.3	0.7	23	0	13	0	10.1	2.4
TWA	824	0	22	2.4	0.4	713	1	15	0	10.4	1.0
UAL	1742	0	12	1.9	-0.1	1657	0	9	0	7.3	0.7
UPS	597	0	34	2.1	0.3	539	0	30	0	8.4	0.7
USA	181	1	22	1.9	-0.2	155	0	13	0	9.8	1.1
VIR	248	0	7	1.9	-0.5	241	1	5	0	8.0	0.6
VKG	50	2	8	2.8	0.5	49	2	4	0	10.9	0.9
WOA	34	0	15	2.5	0.3	36	0	64	0	8.4	0.5
BA	4786	0	1	1.5	-0.1	4782	0	1	0	7.0	1.1
KL	1356	0	0	1.7	0.9	1355	0	0	0	6.3	0.6
LH	234	0	2	2.2	1.2	234	0	0	0	7.8	0.4
N	275	2	16	2.9	1.2	259	0	6	0	8.0	0.4
ADS	145	0	1	1.3	-0.1	145	0	1	0	6.6	-1.8
US ACARS	12901	0	6	1.8	0.5	12899	0	2	0	7.5	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
/NOR	00	Z	100	1	0	0.0	31.0	31.0
DBBH	00	Z	100	11	0	20.3	27.0	-17.7
DBBH	12	Z	100	17	0	19.6	20.5	-6.0
DBLK	00	Z	100	1	0	0.0	20.0	20.0
ELML7	00	Z	100	16	0	14.3	15.8	6.8
ELML7	12	Z	100	19	0	9.7	19.3	16.7
FNOR	00	Z	100	15	0	16.0	21.9	15.0
FNOR	12	Z	100	14	0	12.7	22.4	18.4
FNOU	00	Z	100	14	0	25.9	26.0	2.4
FNOU	12	Z	100	11	1	12.1	12.8	4.2
FNPH	00	Z	100	12	0	25.4	27.3	-10.2
FNPH	12	Z	100	9	0	18.1	18.5	4.2
FNRS	00	Z	100	10	0	19.5	21.1	-8.1
FNRS	12	Z	100	14	0	8.1	10.0	-6.0
JBOA	00	Z	100	1	0	0.0	31.0	31.0
JCCX	00	Z	100	1	0	0.0	44.0	44.0
JDWX	00	Z	100	1	0	0.0	18.0	18.0
JGQH	00	Z	100	1	0	0.0	24.0	24.0
JIVB	00	Z	100	1	0	0.0	38.0	38.0
JNSR	00	Z	100	1	0	0.0	62.0	62.0
LDWR	00	Z	100	28	0	15.5	18.9	-10.7
LDWR	12	Z	100	27	0	14.3	16.3	-8.0
OVYA2	00	Z	100	11	0	21.9	24.0	9.9
OVYA2	12	Z	100	9	0	13.0	15.5	-8.3
OXTS2	00	Z	100	14	0	17.3	22.9	-15.1
OXTS2	12	Z	100	13	0	15.1	15.8	-4.8
SHIP	00	Z	100	1	0	0.0	38.0	38.0
SHIPBX	00	Z	100	1	0	0.0	31.0	-31.0
SHIPCY	00	Z	100	1	0	0.0	10.0	10.0
SHIPCY	12	Z	100	1	0	0.0	40.0	40.0
V2XM	00	Z	100	1	0	0.0	15.0	15.0
V2XM	12	Z	100	3	0	19.7	20.5	5.7
WTEC	00	Z	100	4	0	10.0	16.2	-12.8
WTEC	12	Z	100	2	0	13.0	17.7	12.0
03953	00	Z	100	27	0	13.8	14.4	-4.2
03953	12	Z	100	25	0	15.0	16.3	-6.2
04018	00	Z	100	29	0	57.6	57.7	1.4
04018	12	Z	100	30	0	14.2	18.0	11.0
04220	00	Z	100	9	0	19.2	19.3	2.7
04220	12	Z	100	6	0	8.3	14.2	11.5
04270	00	Z	100	26	0	14.2	14.7	-3.7
04270	12	Z	100	28	0	15.2	17.2	-8.1
04339	00	Z	100	24	0	14.1	16.5	8.6
04339	12	Z	100	21	0	12.9	14.0	5.4
04360	00	Z	100	29	0	16.8	18.0	6.4
04360	12	Z	100	30	0	31.5	32.2	6.8
08001	00	Z	100	21	0	48.9	49.1	4.2
08001	12	Z	100	22	1	11.5	11.5	-0.3
08508	12	Z	100	22	0	15.6	16.4	-5.2
08522	00	Z	100	1	0	0.0	15.0	15.0
08522	12	Z	100	11	0	17.1	17.8	5.0
08594	00	Z	100	1	0	0.0	40.0	40.0
08594	12	Z	100	20	0	12.8	16.5	10.4
60020	00	Z	100	11	0	19.8	20.4	5.1
60020	12	Z	100	9	0	9.4	9.6	-1.8
71600	00	Z	100	28	0	12.8	18.5	13.3
71600	12	Z	100	31	0	16.5	16.5	0.1
72201	00	Z	100	28	0	23.2	23.2	1.6
72201	12	Z	100	30	0	15.1	16.3	-6.3
72402	00	Z	100	28	0	21.6	21.7	2.3
72402	12	Z	100	28	0	17.0	17.0	-1.2
74494	00	Z	100	24	0	14.7	14.9	2.4
74494	12	Z	100	28	1	14.5	20.9	-15.1
78016	00	Z	100	1	0	0.0	2.0	2.0
78016	12	Z	100	28	0	13.9	16.8	9.4

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
/NOR	00	Z	500	1	0	0.0	17.0	17.0
B/TH	00	Z	500	1	0	0.0	7.0	-7.0
DBBH	00	Z	500	13	0	17.4	17.7	-3.3
DBBH	12	Z	500	18	0	15.3	15.3	1.0
DBLK	00	Z	500	1	0	0.0	15.0	15.0
ELML7	00	Z	500	19	0	7.1	9.6	6.5
ELML7	12	Z	500	22	0	9.3	13.0	9.1
FNOR	00	Z	500	16	0	8.6	18.1	15.9
FNOR	12	Z	500	15	0	11.8	22.1	18.7
FNOU	00	Z	500	14	0	13.2	17.7	11.8
FNOU	12	Z	500	12	0	12.6	17.9	12.7
FNPH	00	Z	500	12	0	23.7	25.2	-8.7
FNPH	12	Z	500	11	0	8.2	8.7	2.7
FNRS	00	Z	500	13	0	11.6	13.2	6.3
FNRS	12	Z	500	15	0	10.5	14.3	9.7
FNTH	00	Z	500	1	0	0.0	3.0	-3.0
JBOA	00	Z	500	1	0	0.0	2.0	-2.0
JCCX	00	Z	500	1	0	0.0	3.0	-3.0
JDWX	00	Z	500	1	0	0.0	3.0	-3.0
JGQH	00	Z	500	1	0	0.0	20.0	20.0
JIVB	00	Z	500	1	0	0.0	2.0	-2.0
JNSR	00	Z	500	1	0	0.0	23.0	23.0
LDWR	00	Z	500	28	0	10.3	11.2	4.4
LDWR	12	Z	500	28	0	11.5	12.0	-3.4
OVYA2	00	Z	500	12	0	41.4	42.9	-11.3
OVYA2	12	Z	500	10	0	17.9	26.6	-19.6
OXTS2	00	Z	500	17	0	14.2	15.0	-4.6
OXTS2	12	Z	500	14	0	14.4	17.0	-8.9
SHIP	00	Z	500	1	0	0.0	10.0	10.0
SHIPBX	00	Z	500	1	0	0.0	25.0	25.0
SHIPCY	00	Z	500	4	1	9.9	12.2	7.0
SHIPCY	12	Z	500	2	0	3.5	9.2	8.5
V2XM	00	Z	500	2	0	9.0	9.8	4.0
V2XM	12	Z	500	3	0	37.4	41.2	17.3
WTEC	00	Z	500	7	0	6.9	8.8	-5.6
WTEC	12	Z	500	2	0	2.0	7.3	-7.0
03953	00	Z	500	30	0	12.1	12.1	1.2
03953	12	Z	500	30	0	13.6	14.0	3.5
04018	00	Z	500	30	0	20.2	21.1	6.3
04018	12	Z	500	30	0	11.7	15.2	9.7
04220	00	Z	500	29	0	13.1	14.1	5.3
04220	12	Z	500	30	0	11.5	12.5	4.9
04270	00	Z	500	28	0	15.6	15.8	-3.0
04270	12	Z	500	29	0	15.5	15.6	-1.7
04339	00	Z	500	29	0	12.6	14.2	6.6
04339	12	Z	500	28	0	10.6	13.7	8.6
04360	00	Z	500	30	0	12.1	12.2	1.8
04360	12	Z	500	30	1	9.8	9.8	-0.4
08001	00	Z	500	29	0	13.1	14.7	6.7
08001	12	Z	500	28	0	11.1	12.2	5.0
08508	00	Z	500	1	0	0.0	14.0	14.0
08508	12	Z	500	28	0	11.5	12.9	6.0
08522	00	Z	500	1	0	0.0	11.0	11.0
08522	12	Z	500	11	0	7.6	19.9	18.4
08594	00	Z	500	1	0	0.0	12.0	12.0
08594	12	Z	500	25	0	8.8	13.3	10.0
60020	00	Z	500	28	0	14.9	17.7	9.5
60020	12	Z	500	30	0	14.7	19.0	12.1
71600	00	Z	500	29	0	13.8	14.3	3.7
71600	12	Z	500	31	0	9.7	10.0	-2.3

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
72201	00	Z	500	29	0	8.5	10.3	5.8
72201	12	Z	500	30	0	5.3	5.6	1.6
72402	00	Z	500	29	0	10.3	10.3	-0.5
72402	12	Z	500	30	0	18.0	21.6	-11.9
74494	00	Z	500	28	0	10.2	10.6	-2.9
74494	12	Z	500	30	1	9.0	10.9	-6.1
78016	00	Z	500	1	0	0.0	1.0	1.0
78016	12	Z	500	28	0	7.5	15.0	13.0

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	11	0	0	0.0	1.4	-1.7
DBBH	12	V	100	13	0	0	4.9	-0.8	1.6
DBLK	00	V	100	1	0	0	3.8	0.3	0.1
ELML7	00	V	100	14	0	0	2.4	-0.1	0.3
ELML7	12	V	100	17	0	0	4.2	0.6	-1.8
FNOR	00	V	100	14	0	0	5.2	-1.2	-1.0
FNOR	12	V	100	12	0	0	3.4	-0.6	0.4
FNOU	00	V	100	14	0	0	3.8	-0.3	-0.3
FNOU	12	V	100	12	0	0	5.3	-0.2	-1.1
FNPH	00	V	100	9	0	0	3.2	0.5	0.1
FNPH	12	V	100	5	0	0	3.2	0.4	-0.9
FNRS	00	V	100	10	0	0	3.2	-2.1	0.9
FNRS	12	V	100	13	0	0	3.0	-1.8	-1.2
JBOA	00	V	100	1	0	0	3.5	-7.9	3.6
JCCX	00	V	100	1	0	0	3.5	1.2	15.9
JDWX	00	V	100	1	0	0	3.5	3.7	8.0
JGQH	00	V	100	1	0	0	3.5	0.9	4.2
JIVB	00	V	100	1	0	0	3.5	1.3	0.7
JNSR	00	V	100	1	0	0	3.5	2.4	3.9
LDWR	00	V	100	28	0	0	3.5	-0.3	-0.2
LDWR	12	V	100	27	0	0	2.1	0.1	0.2
OVYA2	00	V	100	9	0	0	2.9	-1.6	-0.3
OVYA2	12	V	100	7	0	0	2.9	0.1	-1.4
OXTS2	00	V	100	12	0	0	2.9	0.9	-1.3
OXTS2	12	V	100	10	0	0	2.7	-0.3	-0.6
SHIPBX	00	V	100	1	0	0	3.6	4.9	18.5
SHIPCY	12	V	100	1	0	100	3.6	-28.6	12.3
V2XM	00	V	100	1	0	0	3.6	0.6	-3.7
V2XM	12	V	100	3	0	0	3.6	-4.8	-1.0
WTEC	00	V	100	3	0	0	3.6	3.8	-4.4
WTEC	12	V	100	1	0	0	3.6	0.1	2.2
03953	00	V	100	27	0	0	4.7	0.1	1.2
03953	12	V	100	24	0	0	3.2	-0.5	0.0
04018	00	V	100	29	0	0	4.7	0.1	-0.5
04018	12	V	100	30	0	0	3.6	-0.5	0.2
04220	00	V	100	6	0	0	1.7	-0.8	0.8
04220	12	V	100	4	0	0	1.7	2.4	1.7
04270	00	V	100	25	0	0	1.7	0.2	-0.1
04270	12	V	100	27	0	0	3.3	-0.6	-0.5
04339	00	V	100	20	0	0	2.8	1.7	-0.1
04339	12	V	100	18	0	0	4.5	1.3	-0.5
04360	00	V	100	26	0	0	3.9	-1.1	1.1
04360	12	V	100	29	0	3	3.3	-3.5	-0.8
08001	00	V	100	20	0	0	3.4	-1.6	-0.2
08001	12	V	100	20	0	0	2.8	-1.0	1.0
08508	12	V	100	18	0	0	3.1	1.3	-0.2
08594	00	V	100	1	0	0	3.3	4.9	4.6
08594	12	V	100	20	0	0	3.3	0.0	2.3
71600	00	V	100	26	0	0	5.1	-0.1	-0.1
71600	12	V	100	29	0	0	3.7	-0.5	1.1
72201	00	V	100	28	0	0	2.7	-0.3	-0.4
72201	12	V	100	30	0	0	3.2	-0.4	0.2
72402	00	V	100	25	0	0	3.4	1.5	1.1
72402	12	V	100	28	0	0	4.3	-0.4	0.4
74494	00	V	100	20	0	0	5.0	-1.1	2.2
74494	12	V	100	25	0	0	2.5	-2.7	1.2
78016	00	V	100	1	0	0	2.9	-3.0	0.9
78016	12	V	100	27	0	0	2.9	0.7	0.0

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 1999

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
B/TH	00	V	500	1	0	0	0.0	0.1	3.9
DBBH	00	V	500	9	0	0	0.0	-0.3	-0.8
DBBH	12	V	500	9	0	0	0.0	-0.4	0.4
DBLK	00	V	500	1	0	0	0.0	4.2	-2.8
ELML7	00	V	500	15	0	0	4.2	0.3	-0.5
ELML7	12	V	500	19	0	0	3.5	0.5	-1.6
FNOR	00	V	500	14	0	0	2.7	1.2	0.8
FNOR	12	V	500	14	0	0	2.9	0.6	0.3
FNOU	00	V	500	13	0	0	3.3	-0.7	0.0
FNOU	12	V	500	12	0	0	3.8	-0.1	1.5
FNPH	00	V	500	10	0	0	2.1	-0.7	0.3
FNPH	12	V	500	7	1	12	4.4	7.2	8.9
FNRS	00	V	500	10	0	0	4.4	-0.3	0.6
FNRS	12	V	500	14	0	0	3.9	1.2	0.9
JBOA	00	V	500	1	0	0	3.8	-1.5	0.8
JCCX	00	V	500	1	0	0	3.8	2.8	5.0
JDWX	00	V	500	1	0	0	3.8	-4.6	4.7
JGQH	00	V	500	1	0	0	3.8	-1.2	-0.3
JIVB	00	V	500	1	0	0	3.8	0.6	-0.5
JNSR	00	V	500	1	0	0	3.8	0.5	1.8
LDWR	00	V	500	28	0	0	3.8	-0.3	-0.7
LDWR	12	V	500	28	0	0	3.2	0.5	-0.4
OVYA2	00	V	500	10	0	0	2.5	-1.0	1.6
OVYA2	12	V	500	10	0	0	5.0	-0.9	-2.9
OXTS2	00	V	500	17	0	0	3.4	-0.4	-1.2
OXTS2	12	V	500	12	0	0	5.0	-0.4	-0.6
SHIP	00	V	500	1	0	0	5.8	-2.6	-3.8
SHIPBX	00	V	500	1	0	0	5.8	6.7	-1.7
SHIPCY	00	V	500	3	1	50	5.8	35.4	-10.7
SHIPCY	12	V	500	2	0	50	5.8	9.9	9.7
V2XM	00	V	500	2	0	0	5.8	-0.6	-1.2
V2XM	12	V	500	3	0	0	5.8	1.8	-4.3
WTEC	00	V	500	7	0	0	5.8	-0.2	-0.9
WTEC	12	V	500	2	0	0	5.8	2.2	2.4
03953	00	V	500	30	0	3	6.0	0.9	1.2
03953	12	V	500	30	0	0	6.2	0.8	0.5
04018	00	V	500	30	0	0	4.4	-0.8	-1.1
04018	12	V	500	30	0	0	3.9	-0.2	-0.1
04220	00	V	500	25	0	4	4.2	1.1	-0.1
04220	12	V	500	27	0	0	5.7	-1.0	0.0
04270	00	V	500	25	0	8	4.5	-1.5	-0.7
04270	12	V	500	29	0	0	7.2	-0.8	0.5
04339	00	V	500	23	0	0	4.8	-1.7	-1.3
04339	12	V	500	28	0	3	4.8	1.6	-1.6
04360	00	V	500	27	0	0	4.8	1.4	-0.2
04360	12	V	500	27	0	7	4.1	-1.8	0.5
08001	00	V	500	29	0	0	3.4	0.1	0.0
08001	12	V	500	26	0	0	3.6	0.2	-0.8
08508	12	V	500	26	0	0	3.7	1.7	0.9
08594	00	V	500	1	0	0	5.8	1.1	-3.0
08594	12	V	500	26	0	0	5.8	-1.0	-1.1
60020	00	V	500	17	0	0	1.9	0.5	0.4
60020	12	V	500	20	0	0	4.5	-0.9	-0.5
71600	00	V	500	29	0	0	3.7	1.6	-0.7
71600	12	V	500	30	0	0	3.3	2.7	1.1
72201	00	V	500	29	0	0	3.3	-0.7	-1.2
72201	12	V	500	30	0	0	2.5	-0.2	-0.7
72402	00	V	500	28	0	0	2.6	1.8	2.4
72402	12	V	500	30	0	0	5.8	1.2	0.8
74494	00	V	500	28	0	0	2.2	-0.6	0.9
74494	12	V	500	30	0	0	3.4	-1.0	0.9
78016	00	V	500	1	0	0	3.7	-0.3	6.2
78016	12	V	500	28	0	0	3.7	1.0	0.6

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45